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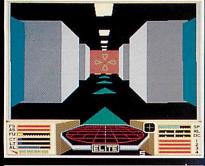
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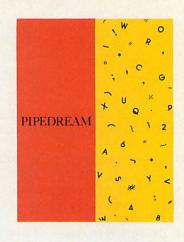
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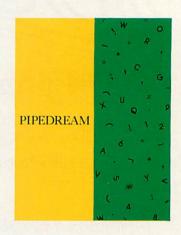
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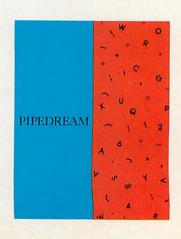
# PIPEDREAM shows its true colours











#### **NOVEMBER 1991** ISSUE 112

**NEWS** 



#### COVER ILLUSTRATION BY MATTHEW RICHARDSON

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#### PRODUCED ON THE ARCHIMEDES

All the editorial pages in BBC Acorn User are produced on a DTP system using Acorn Archimedes 440/1 and A540 computers, Computer Concepts' Impression 2 with Laser Direct printers and Taxan monitors

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This month's entertainments examined in depth

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PC OF CAKE

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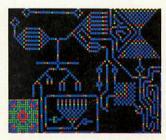
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# Ian Copestake Software OCTOBER 1991

| <b>3</b>  | Of                       | ti            | vare •   | TOBER 1                | 991          |
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| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch  | Rainbow<br>Minerva   | £7   |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch  | Rainbow<br>Minerva<br>Minerva<br>Mitre   | £7<br>£12<br>£575<br>£24   |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii  | £7<br>£12<br>£575<br>£24   |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw<br>Toolkit Plus   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares  | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35  |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw<br>Toolkit Plus<br>Tools Graphics, drawfiles  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>udio £23  |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw<br>Toolkit Plus<br>Tools Graphics, drawfiles<br>Touch Type  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>idio £23<br>£40   |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw<br>Toolkit Plus<br>Tools Graphics, drawfiles<br>Touch Type<br>Tower of Babel  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Knsalis  | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>gidio £23<br>£40<br>£25   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>idio £23<br>£40<br>£25<br>£46   |
| Telling the Time, age 3-12<br>Thundermonk<br>Timetabler<br>Timewatch<br>Tiny Logo + Tiny Draw<br>Toolkit Plus<br>Tools Graphics, drawfiles<br>Touch Type<br>Tower of Babel<br>Tracer<br>Tracker   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight<br>Senal  | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>sidio £23<br>£40<br>£25<br>£46<br>£37   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sto   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>idio £23<br>£40<br>£25<br>£46<br>£37  |
| Telling the Time. age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight<br>Senal  | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>£40<br>£25<br>£46<br>£37<br>udio £25<br>£26   |
| Telling the Time. age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sto   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>idio £23<br>£40<br>£25<br>£46<br>£37  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Stu<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Stu<br>Domark   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>£40<br>£25<br>£46<br>£37<br>udio £25<br>£26   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro St.<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro St.<br>Domark<br>CIS  | £7<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£46<br>£25<br>£46<br>£37<br>£26<br>£26<br>£26<br>£27<br>£22<br>£22  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom   | £7<br>£12<br>£575<br>£24<br>ka £27<br>£35<br>£40<br>£25<br>£46<br>£37<br>udio £25<br>£22<br>£22<br>£22   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Jota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Solf   | £7<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£40<br>£25<br>£46<br>£25<br>£37<br>£22<br>£22<br>£22  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>UBI Solt<br>aniser)   | £7<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£40<br>£25<br>£46<br>£37<br>£40<br>£25<br>£42<br>£22<br>£22<br>£22<br>£22<br>£24  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>UBI Solfi<br>Iniser)<br>ICS   | £75<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£40<br>£25<br>£40<br>£25<br>£22<br>£22<br>£22<br>£24<br>£14  |
| Telling the Time, age 3-12 Thundermonk Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Tivibal Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Str.<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Str.<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Solf<br>inser)<br>ICS<br>ICS   | £7<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£46<br>£25<br>£46<br>£25<br>£22<br>£22<br>£22<br>£24<br>£14   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga   | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>UBI Solfi<br>Iniser)<br>ICS   | £75<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£40<br>£25<br>£40<br>£25<br>£22<br>£22<br>£22<br>£24<br>£14  |
| Telling the Time, age 3-12 Thundermonk Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor   | Rainbow<br>Minerva<br>Minerva<br>Minerva<br>Miner Topologii<br>Clares<br>Micro Str.<br>Iota<br>Krisalis<br>Micro Str.<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Soft<br>Iniser)<br>ICS<br>ICS<br>ICS<br>CIS   | £7<br>£12<br>£575<br>£24<br>£35<br>£46<br>£25<br>£46<br>£25<br>£46<br>£37<br>£46<br>£22<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro St.<br>Iota<br>Krisalis<br>Micro St.<br>Domark<br>CIS<br>Ace<br>WBI Solt<br>Iniser)<br>ICS<br>ICS<br>CIS<br>4th Dim   | £7<br>£12<br>£575<br>£24<br>£35<br>£40<br>£25<br>£40<br>£25<br>£46<br>£37<br>£40<br>£25<br>£22<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17                                 |
| Telling the Time. age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U I.M Utility Disc 1  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti.<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti.<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Soft<br>Iniser)<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS  | £7<br>£12<br>£575<br>£24<br>£35<br>£35<br>£40<br>£25<br>£40<br>£25<br>£46<br>£37<br>£37<br>£42<br>£22<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17<br>£23                   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro St.<br>Iota<br>Krisalis<br>Micro St.<br>Domark<br>CIS<br>Ace<br>WBI Solt<br>Iniser)<br>ICS<br>ICS<br>CIS<br>4th Dim   | £7<br>£12<br>£575 £24<br>£27 £35<br>£40<br>£25<br>£40<br>£25<br>£44<br>£25<br>£22<br>£22<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17                                       |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U I.M Utility Disc 1 Utility Disc 2  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologic<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Soft<br>Iniser)<br>ICS<br>ICS<br>CIS   | £7<br>£12<br>£575<br>£24<br>£27<br>£35<br>£40<br>£25<br>£40<br>£25<br>£40<br>£25<br>£22<br>£22<br>£22<br>£22<br>£22<br>£22<br>£21<br>£14<br>£19<br>£19<br>£13            |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2 View»Mac 3  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Solt<br>Iniser)<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS  | £7<br>£12<br>£5755<br>£244ka £27<br>£355<br>£406 £23<br>£406 £25<br>£466 £27<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17<br>£22<br>£24<br>£14<br>£19<br>£19<br>£13         |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  ViewsMac 3 - Arc/Mac Cable  | Rambow<br>Minerva<br>Minerva<br>Mitre<br>Topologic<br>Clares<br>Micro Sti<br>Jota<br>Krisalis<br>Midright<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>UBI Soft<br>ICS<br>ICS<br>ICS<br>CIS<br>4th Dim.<br>Dataston<br>Dataston<br>Human<br>Human  | E77 E244 E144 E198 E198 E198 E198 E198 E198 E198 E198  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2 View»Mac 3  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologii<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Solt<br>Iniser)<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS  | £7<br>£12<br>£5755<br>£244ka £27<br>£355<br>£406 £23<br>£406 £25<br>£466 £27<br>£22<br>£24<br>£14<br>£19<br>£60<br>£17<br>£22<br>£24<br>£14<br>£19<br>£19<br>£13         |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  View-Mac 3 - Arc/Mac Cable Vox Box  | Rambow<br>Minerva<br>Minerva<br>Mitre<br>Topologic<br>Clares<br>Micro Sti<br>Jota<br>Krisalis<br>Midright<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>UBI Soft<br>ICS<br>ICS<br>ICS<br>CIS<br>4th Dim.<br>Dataston<br>Dataston<br>Human<br>Human  | E72 E72 E72 E72 E72 E72 E72 E72 E73 E74  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  View-Mac 3 - Arc/Mac Cable Vox Box  | Rambow Minerva Minerva Minerva Mitre Topologia | E72 E72 E72 E72 E72 E72 E72 E72 E73 E74  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracker Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  View=Mac 3 - Arc/Mac Cable Vox Box White Magic  | Rainbow<br>Minerva<br>Minerva<br>Mitre<br>Topologia<br>Clares<br>Micro Sti<br>Iota<br>Krisalis<br>Midnight<br>Senal<br>Micro Sti<br>Domark<br>CIS<br>Ace<br>Acom<br>UBI Solf<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS<br>ICS   | E77 E244 E144 E198 E198 E198 E198 E198 E198 E198 E198  |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  View-Mac 3 - Arc/Mac Cable Vox Box  | Rambow Minerva Minerva Minerva Mitre Topologia | E72 E72 E75 E74 E75 E74 E75 E74 E75 E74 E75  |
| Telling the Time, age 3-12 Thundermonk Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orgo - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 1 Utility Disc 2  View-Mac 3 - Arc/Mac Cable Vox Box White Magic White Magic White Magic Wimp Game   | Rambow Minerva | E72 E12 E5757576 E12 E5757576 E2427 E355 E2427 E355 E2427 E355 E2427 E355 E2427 E255 E222 E222 E224 E355 E355 E355 E355 E355 E355 E355 E35                               |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 1 Utility Disc 2  View=Mac 3  - Arc/Mac Cable Vox Box  White Magic White Magic White Magic White Magic Wonderland  | Rainbow Minerva Minerva Minerva Mitre Topologia Clares Clares Micro Sti Iota Krisalis Midnight Senal Micro Sti Domark CIS Ace Acom UBI Solt aniser) ICS CIS  4th Dim Dataston Dataston Human Human Clares 4th Dim  | E7<br>E752 E244 E27<br>E5752 E244 E27<br>E355 E246 E245 E246 E245 E246 E255 E246 E255 E246 E255 E246 E255 E256 E256 E256 E256 E256 E256 E25                              |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 1 Utility Disc 2  View=Mac 3  - Arc/Mac Cable Vox Box  White Magic White Magic White Magic White Magic Wonderland  | Rainbow Minerva Minerva Minerva Mitre Topologia Clares Clares Micro Sti Iota Krisalis Midnight Senal Micro Sti Domark CIS Ace Acom UBI Solt aniser) ICS CIS  4th Dim Dataston Dataston Human Human Clares 4th Dim  | E7<br>E752 E244 E27<br>E5752 E244 E27<br>E355 E246 E245 E246 E245 E246 E255 E246 E255 E246 E255 E246 E255 E256 E256 E256 E256 E256 E256 E25                              |
| Telling the Time. age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orgo - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 2  View-Mac 3 - Arc/Mac Cable Vox Box  White Magic 2 + Designer Wimp Game Wonderland Words and Pictures World Geography Maps, draw   | Rambow Minerva | E7 E   |
| Telling the Time, age 3-12 Thundermonk Timetabler Timewatch Tiny Logo + Tiny Draw Toolkit Plus Tools Graphics, drawfiles Touch Type Tower of Babel Tracer Tracer Tracer Transport, drawfiles Trivial Pursuit Turbo Type Tween Twin Twin World TWO (Task and Window Orga  - site licence Typing Tutor  U.I.M Utility Disc 1 Utility Disc 1 Utility Disc 2  View=Mac 3  - Arc/Mac Cable Vox Box  White Magic White Magic White Magic 2 + Designer Wimp Game Wonderland Words and Pictures World Geography Maps, draw WorldScape   | Rainbow Minerva Minerva Minerva Minerva Minerva Mitre Topologic Clares Clares Micro St. Iota Krisalis Midnight Senal Micro St. Domark CIS Ace Acom UBI Soft INSS CIS CIS 4th Dim Dataston Dataston Human Clares 4th Dim 4th Dim Virgin Chalksol Micro St. Eclipse Eclipse Eclipse (Micro St. Eclipse)  | E7<br>E752<br>E5752<br>E244ka E275<br>E353<br>E346ka E275<br>E466<br>E225<br>E226<br>E227<br>E227<br>E227<br>E228<br>E228<br>E228<br>E228<br>E228                        |
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| IDEARCIN80L                 | £389    |
| IDEARCIN120L                | £549    |
| IDEARCIN200                 | £839    |
| A300/400/500 external upg   | rades   |
| (May also be fitted to A30  |         |
| nal expansion slot using a  |         |
| case or racking system)     |         |
| IDEARCEX40                  | £395    |
| IDEARCEX40L                 | £449    |
| IDEARCEX80L                 | £499    |
| IDEARCEX120L                | £699    |
| IDEARCEX200                 | £935    |
| A3000 Fully internal upgra  | des     |
| IDEA3IN20                   | £375    |
| IDEA3IN40                   | £575    |
| IDEA3IN60                   | £775    |
| Fitting if required         | £35     |
| A3000 External upgrades     |         |
| (External drive using inter |         |
| expansion slot; can combi   | ne with |
| PRES Disc Buffer Board)     |         |
| IDFA3FX40 etc               |         |

- prices as IDEARCEX40 etc + £10

#### SEPARATES

| Additional hard discs            |      |
|----------------------------------|------|
| IDEA40L 40Mb                     | £219 |
| IDEA80L 80Mb                     | £309 |
| IDEA120L 120Mb                   | £459 |
| A3000 accessories                |      |
| IC PLINTH                        | £18  |
| (The best monitor stand)         |      |
| IdeA cards and accessories       |      |
| (For use with your own IDE ha    | ard  |
| discs; we can only accept res    |      |
| sibility for performance with di | scs  |
| we have tested ourselves)        |      |
| IDEARCIN Archimedes Internal     | £110 |
| IDEARCEX Arc External            | £140 |
| IDEA3EX A3000 External           | £140 |
| Internal hard disc cradle kit    | £15  |
| Fan kit (Standard)               | £12  |
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Recommended for backing up
Beebug Hard Disc Companion £35
Recommended for an easier life
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£15

Case + power supply & fan Fan kit (A3000 Internal)

Cable for second hard disc

#### HARDWARE PRODUCTS

| PRINTERS                   |            |        | MICE, MONITORS   |  |       |
|----------------------------|------------|--------|--|--|-------|
| ArcLaser                   | Calligraph | £895   | Clares Micro Mouse   | Clares   | £26   |
| ArcServer                  | Calligraph | £985   | 9060S  | Eizo   | £450  |
| Bubble Jet BJ-10e          | Canon      | £205   | 9070S  | Eizo   | £640  |
| Bubble Jet BJ-300          | Canon      | £360   |  |  |       |
| Bubble Jet BJ-330          | Canon      | £405   | SCANNERS, DIGITISER  | S  |       |
| Laser Direct Qume          | CC         | £856   | ArcScanner including Ep  |  | 0     |
| Laser Direct LBP-4 Card    | CC         | £323   |  | Clares   | £1660 |
| Laser Direct LBP-8         | CC         | £1280  | FaxScan  | Spacetech  | £94   |
| - new toner cartridge      |            | £65    |  |  |       |
| LBP-4                      | Canon      | £660   | FX9600AT +Maintenance  | Amstrad  | £376  |
| Archimedes parallel printe | er cable   | 83     | Hawk V9  | Wild Vision  | £330  |
| The second second second   |            |        | - A3000 version  | Wild Vision  | £390  |
| FUNCTION KEY STRIP         | ORGANISI   | ER     | Image (colour)   | Irlam  | £589  |
| Arckey                     | ICS        | V0 £3  | i-Scan 200   | Idam   | £539  |
| - quantity of 4            |            | V0 £10 | i-Scan 400   | Idam   | £589  |
| 4                          |            |        | Scan-Light A4  | CC   | £346  |
| MEMORY, ARM3 ETC           |            |        | - with Sheet Feeder  | CC   | £431  |
| Fitting extra unless sta   | ted        |        | Scan-Light Junior  | CC   | £174  |
| † Fitting is straightforw  |            |        | - A3000 internal   | CC   | £174  |
| ‡ Fitting requires expe    |            |        | Scan-Light Junior 256  | CC   | £205  |
| A3000 2 Mb Non-upgrada     | able †     |        | - A3000 internal   | CC   | £205  |
|                            | IFEL       | £55    |  |  |       |
| A3000 2 Mb Upgradable      | †          |        | ODDULES  |  |       |
|                            | IFEL       | £63    | AnDi   | Baildon  | £49   |
| A3000 4 Mb †               | IFEL       | £149   | I <sup>2</sup> C SWI   | Baildon  | £15   |
| A310 2 Mb Upgradable in    | C MEMC1    | a ‡    | <ul> <li>bought with Oddules</li> </ul>  | and the state of t | £5    |
|                            | IFEL       | £99    |  |  |       |
| A310 4 Mb Solder-in inc I  | MEMC1a ‡   |        | Oddule Adaptor   | Balldon  | £10   |
|                            | IFEL       | £POA   | A CONTRACTOR OF THE PARTY OF TH |  |       |
| ARM3 ‡                     |            | £400   | (needed with your first  | Oddule   |       |
| 4-slot 4-layer Backplane   | IFEL       | £59    | unless you have an I20   | C socket)  |       |
| A310 RISC OS Carrier Bo    | pard ‡     |        | AND REPORT PARTY STREET, STREET, ST  | MARY LOS   |       |
|                            | IFEL       | £25    | KEYBOARD COVERS  |  |       |
| A300/400 Fan kit           | ICS        | £12    | Seal 'n Type (spill-proof)   |  |       |
| ASUU/4UU Fall Kil          |            |        |  |  |       |
| Fan filters (set of 10)    | ICS        | £4     | - Archimedes   | Kador  | £14   |

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VAT, UK customers please add 17.5% to the total price, except for the zero-rated items marked V0. Our VAT number is 384 3312 56.

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#### **NEW MACHINE PREVIEW**

# A5000 - PC STYLING WITH RISCOS 3 AND THE SPEED OF ARM3

AS EXCLUSIVELY revealed in last month's BBC Acorn User, Acorn is launching a new PCstyle machine with an enhanced operating system and Arm3 processor.

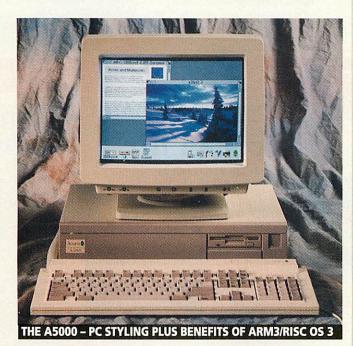
The Acorn 5000 features an enhanced version of Risc OS 2 - namely, Risc OS 3 - and a 'go faster' Arm3 processor (as found in the A540).

The new machine - which is a three box solution, including keyboard, base unit and monitor - is designed to complement the current range of Archimedes 32-bit Risc computers and fits between the 400 series and the top-of the-range A540. However, the A5000 will effectively replace the A440/1 in the current Archimedes range, although Acorn says that the A410 and 420 machines will be available 'for the foreseeable future'.

There are two versions of the A5000 - a 2Mb model with 40Mb hard disc costing £1,499 and a 1Mb base model (to be released later) costing £999. The price of the 2Mb model includes a newly designed PC/AT keyboard and Acorn 14in multiscan monitor.

The high speed of the Arm3 processor combines with a faster Ram access time than is found in the current A400 series to deliver a fast machine for such applications as desktop publishing.

The machine features a serial port, a centronics printer port and four Eurocard-sized expansion slots, permitting expansion at a lower cost than with other systems. The addition of PC storage devices or special interface cards allows the system to be customised to



meet the user's needs.

The A5000's floppy disc drive can now handle up to 1.6Mb of information, which is double the existing 800K standard.

IBM PC discs can also be used and the operating system automatically adjusts to whichever format the disc is in, without the need for a separate software utility.

The machine also allows users to take full advantage of the cost effective IDE technology, now standard in personal computing, with the 2Mb system incorporating a fast 40Mb hard drive.

Acorn's intention in designing the machine was to make it more 'industry compatible'. Because the A5000 is fast, it can behave like different computers simultaneously. By using Acorn's PC Emulator

software, data from, say a Dos spreadsheet or database can be combined into a business report running under the Risc OS desktop, thereby taking advantage of the A5000's graphics and range of saleable fonts. With X software, the A5000 can be an X terminal, accessing open systems.

With networking options and TCP/IP protocol, the A5000 communicates easily with other computers using standard Ethernet and Econet.

Acorn's marketing director, Mike O'Riordan, said: 'The new A5000 now joins Acorn's family of Archimedes computers. Performance for its own sake is not the question, it is how it is delivered to your desktop that is the key. With the A5000 and Risc OS 3, the power of the Arm processor can be utilised.'

#### **SPECIFICATIONS**

Below is an at-a-glance guide to the specifications of the A5000.

PROCESSOR

Arm3, 25MHz, 4K cache

STANDARD MEMORY

1 or 2Mb, upgradable to 4Mb

HARD DISC DRIVE

Optional 40Mb 3.5in form factor PC/AT interface (IDE)

FLOPPY DISC DRIVE 3.5in form factor

FORMATS SUPPORTED

720Kb Dos 1.44Mb Dos 800Kb ADFS E 800Kb ADFS D 1.6Mb ADFS F

INTERFACES

Parallel centronics RS232C serial Four single-width Eurocard expansion slots

MONITOR OPTIONS Broadcast, Scart TV, multi-frequency, VGA

 GRAPHICS RESOLUTION PAL TV scan rate

(640 x 256 pixel) 256 colours VGA (640 x 480 pixel) 16 colours

VGA+ (640 x 480 pixel) 256 colours

STEREO SOUND OUTPUT Via 3.5mm stereo jack

NETWORKING

Econet module required Ethernet expansion cards supported

DIMENSIONS

100H x 430W x 340D (mm)

· WEIGHT

16Kg ● KEYBOARD

103 key, enhanced industry standard layout Detachable coiled 1.5m cable

 EXPANSION CARD OPTIONS SCSI, MIDI, IEEE 488, STE bus controller, video frame grabbers, sound samplers, transputer boards

PRINTERS

Risc OS printer drivers include: Apple Laserwriter, PostScript, HP Laserjet, Canon/Integrex 132 colour, dot-matrix Epson compatibles

NOMINAL DC POWER

70W max (continuous) 76W max (surge)

WARRANTY

12 months

PRICE

£1499 (2Mb model)

# New from RISC Developments (BEEBUG's R&D operation)

## **DeskEdit**

#### General editing features

Three special Find and Replace modes - from Simple to Power Search Additional Quick-Search mode for rapid retrieval

Text macros to insert user strings in both text and source code

Special Undelete buffer for moving text around, in addition to Edit-style Undo/Redo

Dedicated markers and position finders for finding your way around large files.

Clipboard, providing an alternative way to move text around



On screen Help - full documentation in a scrollable window Instant file info feature, and current directory

Caret flash controller for DeskEdit and other applications

Customised user commands to open directories, run other applications and launch Obey files

Numerous keyboard shortcuts including date and filename insertion, changing case, moving windows to the front or back of the stack, parking the mouse pointer, inserting printer codes etc

#### Printout



An advanced all-purpose multi-tasking Text Editor for the Archimedes,

with special features tailored for use with plain text, Basic and C source.

Fast text printout including style codes for bold, underline, italics, page breaks etc.

Special text printing options with headers, footers, page numbering and style codes.

Useful Preview mode.

A Statistics option with a summary of aspects of the text to be printed

#### Language specific features:

DeskEdit will format wordwrapped plain text as you

Basic files will automatically be detokenised, when you drag them to the icon, and loaded into DeskEdit ready for editing. F3 will retokenise and save them after editing. Function and Procedure browser. Automatic line number insertion. Special **C language** features. Auto indent facility combined with automatic generation of

opening braces streamlines source code entry. C function browser and synthax

## Other Archimedes Products from RISC Developments

A selection of 12 multi-tasking

## Desktop **Applications**

DataSheet - data presentation package for creating annotated graphs

Calc\_570 - an implementation of a scientific calculator.

CharDes character designer for

creating new system fonts.

Diary - a Desktop diary and calendar.
B\_to\_T allows Basic programs to be edited without leaving the Desktop.

 FileFind performs a hierarchical search for a given file, application or directory

SetType - change the filetype of any file by dragging it to the icon bar.

· HotKeys - allows single key presses to perform wide range of functions. · Mouse - change the mouse speed merely by

clicking on an icon. Print allows files to be printed just by dragging

them to the icon bar.

NotePad for up to eight pages of jottings

Dustbin - sits on the icon bar and allows files to be deleted by simply dragging them to its icon

An all-purpose reference finder for books, magazines and manuals

## ArcScan III

Contains the following Databases:

• RISC User Volumes 1 - 4 • BEEBUG Volumes 1 - 9 • Index to RISC OS Programmer's Reference Manual

· Index to ANSI C Manual (Release 3)

Index to BBC Basic Guide • Index to RISC OS User Guide

#### ArcScan III features:

flexible keyboard

search on any entry dvnamic memory management

improved search logic - choice of 3 logical operators: OR, AND and NOT

dedicated ARM code

routines enabling rapid information retrieval fast scrolling Wimp window displaying finds

detailed manual and extensive on-screen help

new extended wildcard option

· fully user customisable

# NEW ART

#### ArcScan Library Disc

Offers an index for Acorn User and Micro User magazines from January 1987 to date.

The Library Disc will be regularly updated to include the latest issues, and upgrades will be available for £4.45. As a Special Offer you can purchase an ArcScan Library disc with vouchers for two upgrades for the price of £16.95.

### Wimp Programmer's **Toolkit**

Twelve powerful multi-tasking utilities an essential aid to any programmer

Wimp Debugger - debug

Wimp-based programs while testing and running them

Spyglass - displays the contents of memory allocated to any task currently running.

Template Editor - Acorn's FormEd for designing windows

Template File Browser- view the contents of a template file.

Application Shell Generator utility for creating application directories, Obey files and their sprites.

Menu Editor for creating and editing Wimp menu structures.

WimpAid allows pointer, window and icon parameters to be dynamically displayed on screen. Iconbar Shell Generator - create simple multi-tasking programs

Desktop File Loader allows you to load a program from the Desktop, rather than run it.

Icon Flag Generator calculates the value of icon flags.

Wimp Message Monitor - monitors the Wimp polling system.

EasyWimp provides a ready-made Wimp application shell to

be used for creation of single-window applications.

# **ArcOmnibus**

#### 7 Original Archimedes Games

Amaze - a graphically superb sliding block game with a difference.



Cribbage - an excellent implementation of

the well known card game.

Moric - a colourful 'ladders and levels' game.

Ogre's Lair - a highly entertaining arcade type game, providing hours of fun.

Pick a Pair - a colourful game testing your

of observation and memory. BalloonMan - burst the balloon - a Pacman

style of game Dominoes - a Desktop version of the classic



## File Handling for All

by David Spencer and Mike Williams

File Handling for All is a comprehensive book which covers all the requirements of data storage and processing by computer, using the popular BBC Basic programming language for the examples. It is aimed at anybody interested in File Handling and Databases, whether beginners or more advanced users, and will appeal to all who want to learn more of this important subject.

of this important subject.

The book starts with an introduction to the rudiments of file handling, and in the following chapters develops an in-depth look at the different types of files e.g. serial files, indexed files, direct access files, and searching and sorting. A separate chapter is devoted to hierarchical and relational database design, and the book concludes with practical advice on developing file handling programs.

The associated disc (£4.75) contains complete working programs based on the routines described in the book and a copy of Filer, a full-feature Database program.

| DeskEdit  | £24.95       | Stock Code PEDTa |     |
|---|--------------|------------------|-----|
| Wimp Programmer's Toolking  | £19.95       | Stock Code PWPTa |     |
| Arcscan III   | £18.95       | Stock Code PAS3a |     |
| Arcscan Library Disc  | £ 9.95       | Stock Code PAL1a |     |
| Desktop Applications  | £14.90       | Stock Code PDA1a |     |
| ArcOmnibus Games  | £14.90       | Stock Code PAOMa |     |
| File Handling for All   | £ 9.95       | Stock Code BKO2b |     |
| Disc supporting the book  | £ 4.75       | Stock Code BKO3a |     |
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117 Hatfield Road, St. Albans, Herts AL1 4JS Tel. (0727) 40303 Fax. (0727) 860263



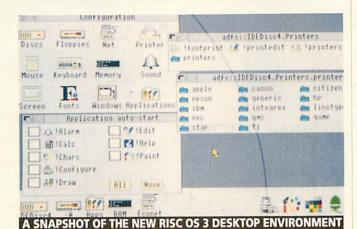
# **MORE POWERFUL RISC OS 3** AT HEART OF NEW A5000

THE NEW version of Acorn's Rise operating system, Rise OS 3, which is included with the new A5000, features around 300 key enhancements over previous releases.

Improvements are designed to provide increased functionality for the user, as well as additional programming interfaces for software developers.

There are a number of key changes incorporated into the new operating system. including:

- Multi-tasking filer operations, allowing the computer to be used while filing operations (copying, moving, deleting, etc) take place.
- Improved versions of the main applications, such as Edit, Paint and Draw, as well as 12 commonly used font styles and the outline font manager, are now in Rom. releasing up to 150Kb of extra user work space.
- Automatic start-up of the Rom applications when the computer is switched on.
- No limit to the number of windows that can be opened at the same time. They can be moved partly off screen to increase space.



- Desktop saving, enabling you to save the computer's state and restore it when you next use the machine.
- Iconised windows, which enable an open window to be shrunk to the size of an icon and stored on the desktop background.
- Improved printer support via a new printer driver manager, making it possible to have more than one printer connected at the same time, with all connected printers accessible from the desktop.
- MS-Dos format discs can be read and data can be moved between the A5000 and any

- computer running MS-Dos.
- Broadcast loading on Econet networks, improving the speed at which data is loaded on multiple computers.
- Up to 128 tasks running together. This compares with just 32 allowed by the current Risc OS 2.
- Extension modules are now in Rom.
- Icon bar grouping.
- New hot keys which can open a task window, move the icon bar to the front and initiate shutdown.
- A screen blanker which helps preserve the monitor screen.

#### **APPLICATIONS**

THE COMBINATION of the A5000 and enhanced Risc OS 3 operating system provides a number of useful applications, many of which have not been available before. Here is a breakdown.

#### ROM-BASED APPLICATIONS

Paint - pixel editor

Edit - fully featured text editor

Draw - drawing package

Alarm - set to meet appointments Calc - calculator

Chars - displays character for new

Configure - machine configuration Help - interactive help system

#### DISC-BASED APPLICATIONS

Pinboard - files, applications, etc can be attached to the desktop Printeredit - control common printers or save your own driver Fontprint - allows Risc OS fonts to be used on PostScript printers Scicalc - scientific calculator

Puzzle - sliding block puzzle 65host - latest version

65tube - emulates 6502 second processor

Clock - analogue clockface Mailman - for sending/receiving electronic mail

Maestro - includes new tunes and print score facility

Patience - that game!

Tinydirs - for keeping directories on the icon bar

Lander - hover ship game Madness - novelty toy Magnifier - magnifies the screen New printer drivers - support for rational, simultaneous drivers

#### CHANGES TO CONFIGURE

The Configure application has been redesigned to give more control over the computer's configuration. It provides control over:

- ★ The number of hard and floppy disc drives connected to the computer
- ★ The settings related to use of the Econet network
- \* The default port to be used for printing not done via Risc OS 3 printer drivers
- \* Mouse sensitivity and speed
- ★ The different aspects of the keyboard
- ★ Default memory allocations
- ★ The computer's sound system ★ The screen display options
- \* Thresholds used by the font manager
- ★ The window manager options
- ★ The Rom applications which are started automatically.

# RISC OS 2 - WILL IT **BECOME REDUNDANT?**

ACORN has undoubtedly taken a step forward with its new operating system, Risc OS 3. But how will that affect users of machines currently running Rise OS 2? Will software continue to be produced for them? And will they be able to upgrade their machines to the new operating system, assuming they do not want to buy the new A5000?

According to Acorn, Risc OS 3 will be available only on the A5000, at least initially. However, an upgrade from Risc OS 2 to Risc OS 3 will be available, but this is unlikely to be until Spring next year. The ease of fitting new Roms and the cost of doing so have yet to be confirmed.

Meanwhile, indpendent software vendors (ISVs) have already started to develop new software (or versions of current software) for the new operating system. Charles Moir of Computer Concepts. which produces Impression 2 desktop publishing software, confirmed that the company would be producing versions of current software for Risc OS 3, while continuing to support Risc OS 2 users. He also expected to take a two-version approach to new software development because of the sizeable Risc OS 2 user base.

# NEW VERSIONS OF LEARNING CURVE

TWO NEW Learning Curve packages, featuring the A3000 and the new A5000 respectively, are being launched.

Both packs include 1st Word Plus, Genesis Plus and a number of games, including Pacmania. Also included with the A5000 LC is Acorn's Desktop Publishing and PC Emulator software. A new magazine. Home Computing with the Learning Curve, is also included.

The A5000 LC costs £1,799 with a multi-scan monitor and the A3000 LC costs £999 with an RGB monitor.

• STOP PRESS A new Acorn inkjet printer, the JP150, will be bundled with the new Learning Curve package.



# **WATFORD ARM3 UPGRADE BOARD IS LESS THAN £200**

A SUB-£200 Arm3 upgrade for the Archimedes/BBC A3000 is just one of the new products due to be launched at the BBC Acorn User Show by Watford Electronics.

Other new Watford products range from a colour scanner to an infra-red cordless mouse.

 The Arm3 MkII upgrade is designed to replace the Arm2 processor in the A3000/Archimedes and increases operating speed by between two and five times, depending on the application in use.

Measuring  $44 \times 53$ mm, it stands just 6mm above the original Arm2 socket. A purpose-made, 84-way goldplated connector ensures that firm contact is made with the chip socket.

A special tool is included for DIY fitting, or Watford can arrange for your machine to be picked up and returned after installation. The support software provided on disc includes a CacheKey module and a desktop application to control



the Arm3. Activation of the Arm3 may be user-defined. The cost is £199.

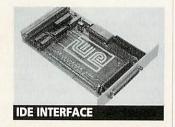
There are two new Watford scanners. The 256 grey level scanner is a hand-held model offering between 100 and 400dpi. Grey levels per dot range from 4 to 256 and there are also three monochrome modes, black and white and two dither patterns. Scanning speed is 3ms per line.

The hand-held 105mm colour scanner offers 12-bit colour per dot, 200 dpi resolution and a scanning speed of 3.5ms per line. A postcard can be read in 11.5sec with 4096 colours at 400dpi.

The cost of both scanners has yet to be confirmed.

 The new IDE interface card brings the latest advances in PC hard disc technology to Archimedes users. The Watford interface allows IDE drives to work on any Archimedes and speeds equivalent to SCSI drives can be obtained at a fraction of the cost. Up to four cards can be installed in a machine, with up to two drives to each card. Prices range from £249 for the 44Mb version to £535 for the 200Mb card.

Other new products include an A3000 user I/O internal expansion card (£42), an Aries AlphaScan monitor (£325), a VIDC enhancer board (£45) and an infra-red cordless mouse. Contact Watford Electronics on (0923) 37774.



## **ELITE ON** THE ARC

THE GAME that started life on an Acorn Atom and went on to become the mega-selling BBC micro game is now available for the Archimedes/A3000, writes Sam Greenhill.

News broke a couple of months ago of the impending release of the Archimedes version of Elite, but the publisher has only just been announced.

Hybrid Technology, best known for its music products, is launching the game at the BBC Acorn User show. Hybrid was chosen because its members once worked for Acornsoft in helping to produce the original Elite.

Archimedes Elite will be sold for £39.95 and the packaging will include the game on one disc, the manual, the ship identification poster and, new for the Archimedes, a Galaxy One trading route guide outlining the safest and most dangerous trade paths.

The Dark Wheel novella will not feature, but Hybrid is hoping to include an 'add-on dashboard' - a fold-out cardboard extension which fits on to the front of the monitor and should enhance the realism of the game.

Turn to the Games Supplement in this issue for a preview of Archimedes Elite and see next month's issue for a full review.

# **NEW LASER PRINTER AND SCANNER**

COMPUTER CONCEPTS has announced a new 600dpi laser printer for less than £1000,

The LaserDirect HiRes4 is based on the Canon LBP4 and is offered complete with expansion board and software at the reduced price of £999 one-third less than the cost of its nearest equivalent, says CC.

The complete system consists of: the LBP4 printer with video interface and expansion board: the latest LaserDirect software offering Epson emulation and 128 grey level printing; the fastest printer drivers available for the Archimedes: Econet and Nexus network compatible options; serial and parallel interfaces; 300 and 600dpi printing resolutions; and one year onsite maintenance.

Also released is a new SCSI-based flatbed scanner offering 300dpi 256 grey scale scanning. The ScanLight Professional fills the gap in the top end of the Archimedes

market and retails for £899.

For further details, you can contact Computer Concepts on (0442) 63933.



LASERDIRECT HIRES4 600DPI LASER PRINTER

#### A3000 VIDEOS

IF YOU have been waiting for video versions of our popular First Steps introductory series on the A3000/Archimedes, four new videos, offering a step-by-step guide to the machines and various applications, have just been released by London-based company, Pedigree Films.

The titles include Up and running, Text Processing, Data handling and Art and graphics. The videos cost £14.99 each from: Pedigree Films, Trinity Business Centre, 305 Rotherhithe Street. London SE16 1EY. Tel: 071-231 8271.



# YOUR MISSION

- This game's a doddle. Even for the inexperienced player.
- Simply track down the thousands of computer games equipment bargains at the Christmas Computer Shopper Show at Wembley.
- Select transport option: train (BR Wembley Central) tube (Wembley Park: Jubilee and Metropolitan lines) bus or car (ample parking).
- Arrive at the newly extended Wembley Exhibition Centre between 10.00 hours and 18.00 hours during the period:
- Thursday 5th December to Sunday 8th December.
- Once inside you'll find yourself in a maze of over 200 stands brimming with bargains.
- Now the real task begins: net more than you could ever dream of for your money.
- ▶ Bonus points: buy your tickets today and save money (up to £5.00) on the admission price and get a time bonus (beat the queues).
- You can't lose, but good luck anyway.



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# TESCITE.



THE
PRINCIPLES
OF
PRESENTER
TAKEN
TO
NEW
HEIGHTS



Following extensive research amongst Presenter II and Hotlink Presenter users, Lingenuity is delighted to introduce Presenter GTi.

Generating a vast range of graphs and charts has never been easier. Data is entered and edited via a simple worksheet, and all graphs can be saved as genuine draw files and/or transferred into other applications.

Presenter GTi's Hotlink option gives the user the ability to communicate with other applications such as Pipedream 3 - allowing relevant data to be updated continuously for the displayed graph.

#### **EXISTING**

#### PRESENTER FEATURES:

Bar, Line & Pie charts
3-Dimensional displays
Auto scaling
Fast Hotlink transfer
User definable layouts
Full colour or monochrome graphs
Supports CSV file format for loading and saving data

#### **NEW GTI FEATURES:**

Multiple Pie chart display
Logarithmic axis scaling
Regression line (Line-of-Best-Fit) data
available: Constant, Gradient, t ratio,
Residual value, R<sup>2</sup>
Function key short cuts
Zoom option for graph display
Multiple document capability
Multiple view option
File Information box
Instant display of saved graphs

#### **ENHANCED GTI FEATURES:**

Wider range of Graph types:-

- 8 different types of Bar charts
- 4 different types of Line charts
- 3 different types of Pie charts Scattergrams
- 2 different types of area chart

Dynamic worksheet area.
Comprehensive file information
Auto Label/Data detection
Easier-to-use data entry window
Increased display options for all graphs
Faster draw and screen update routines
Grids available for all graphs
Data point symbols - selectable
Line patterns - selectable



Presenter GTi conforms fully to RISC OS guidelines and has been designed to be part of your essential productivity tool software library.

C69.95

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PROFESSIONAL

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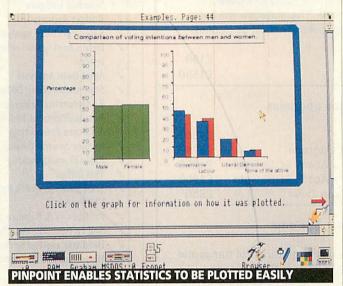


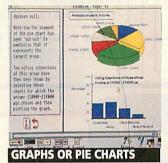
# **ACCURATE PINPOINTING**

LONGMAN LOGOTRON has just released what has been described as a 'new generation database where handling is as easy as in DTP'.

Pinpoint for the BBC A3000/Archimedes places the emphasis very much on the collection of information and its analysis. Among other functions it provides:

- DTP-style facilities which allow the user to create and publish any sort of data form, from single to multiple pages
- A WYSIWYG data entry facility, where data can be quickly entered directly onto the form using the mouse or the keyboard
- A table browser, which allows the sorting and selection of information, the calculation of statistics and the export of collected data
- A graphic analysis workbench, enabling information to be analysed using a wide range of chart and graph types
- A graphics presentation editor, allowing graphs and charts to be combined with text frames, sprites and draw files.





Presentations can be saved and printed, as well as exported into a wide variety of other Risc OS applications. Pinpoint for the A3000/Archimedes costs £99.

 Longman Logotron has recently moved to new premises, which are at 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS. Tel: (0223) 425558.

## **LOGGING ONTO BEEB BB**

ACCESSING a bulletin board will give pupils at key stages 3 and 4 a hands-on opportunity to experience acquiring and communicating information, writes David Watkins, BBC Education Officer.

Schools do not need to subscribe to use a bulletin board. unlike the commercial services, such as Prestel and Campus 2000, and there are many boards located across the country. Most schools should be able to find one that will be suitable for their own particular needs; within their local telephone area.

The BBC Education bulletin board was initially set up to allow the transfer of files between regional offices, and spare capacity allowed it to be opened up for public access. Facilities include a public message area, a schools message area, and facilities for E-mail.

London-based schools can access it for the cost of a local telephone call.

The BBC Education bulletin board runs on a TRS-80 model 4 with a 15Mb hard disc, rescued from the Micro Live office when that particular series ended, and is available 24 hours a day on 081-752 5990. The system operator is usually around during office hours if help is needed. It operates at a baud rate of 300/300 (v21) and the format is eight bits with no parity and I stopbit (8N1).

In terms of the National Curriculum, the use of E-mail supports reading and writing in English (AT2, AT3) and modern languages (AT3, AT4). It also directly addresses the communicating information strand of the Information Technology Orders at key stages 3 and 4.

#### MAGIC BUS

LINDIS, the Suffolk-based hardware and software supplier, has kitted out a double decker 'technology bus' tour schools and colleges in the east of England.

The pink and blue bus has been equipped with the latest Acorn computer hardware, software and peripherals and is being used as a mobile demonstration and training centre. It is visiting user groups, exhibitions and businesses, and various educational establishments. Contact Lindis on (0986) 85476.



#### **NEWS IN BRIEF**

- A NEW low-cost touchscreen for the Archimedes has just been announced by Hybrid Technology. The Access 2000 Touchscreen costs £188, making it attractive to primary schools, and works on a standard A3000. Because it connects via Hybrid's AccessLink - the interface that daisy-chains multiple add-ons via the printer port - it avoids the need for a serial port upgrade, Contact Hybrid Technology on (0223) 861522.
- HITACHI New Media has joined forces with Acorn to sponsor a free demonstration CD-Rom disc. It contains numerous audio utilities. 300Mb of demonstration software, 32-bit images and utilities, oh, and the full text of the Bible. Hitachi will be mailing the disc, designed to promote the company's CD-Rom drives, to all LEAs, secondary schools and further education establishments. Contact Hitachi New Media on 081-849 2092.
- HS SOFTWARE has released its latest Fun & Games compilation for the A3000/Archimedes. Included are: Coconuts, where you help a character pick the right fruits from tropical trees; Burger Boy, where you make up orders in a burger bar; and Tidy, where you help a character called Emma tidy her bedroom. The package costs £19.95. Contact HS Software on (0792) 204519
- CARVIC has launched an enhanced version of DrawAid, the package that allows Basic programmers to produce Draw files directly from their own programs. The standard procedures supplied allow complex and precise drawings to be produced without any knowledge of the detailed structure of Draw files and the utility complements the Acorn-supplied Draw application.

Drawings of any basic mathematical expression can be produced and they are compatible with DTP applications using standard Draw files. The package costs £10 and is available from Carvic Manufacturing, Moray Park, Findhorn Road, Forres, Moray, Scotland IV36 OTP. Tel: (0309) 72793.

THE BIG BEN Club is holding its ninth annual open day on October 26. The venue is at Community-Centre de Kiekmure, Tesselschadelaan 1, at Harderwijk, 40kms NE of Utrecht, off the A28 motorway on the borders of the old Zuyderzee.

#### **Gnome Computers Limited**

25A Huntingdon Street, St. Neots, Cambs, PE19 1BG Tel./Fax: 0480 406164 E-Mail: support@gnome.uucp

#### X Window System R11.4

This new software package, developed in association with Acorn Computers, converts a RISC OS based Archimedes into an X Terminal. The software will allow communication with X clients over Ethernet or Econet.

| X Software                | £199  |
|---------------------------|-------|
| Complete X Terminals from | £1550 |

#### Archimedes upgrades

| 30MHz ARM 3 Upgrade                       | £430  |
|---|-------|
| A440/R140 4-8MB Memory Upgrade            | £675  |
| External SCSI 200MB H/D + Acorn SCSI Card | £1250 |
| External SCSI 750MB H/D + Acorn SCSI Card | £1900 |
| External 150MByte SCSI Tape Drive         | £850  |

#### **Transputer Systems**

Gnome Computers offers a complete range of transputer boards to fit into either RISC OS or RISC iX based Archimedes machines. Prices start at £1385 for a single 10 MIP, 2 MFLOP transputer system including a parallel FORTRAN-77, C, Pascal, Modula-2 or Occam compiler.

#### **UNIX Specialists**

# Arcounts Manager

#### The Professional Solution

#### **FEATURES**

- Sales, Purchase, **Nominal Ledgers**
- **Budget Reports**
- Sales/Purchase Analysis
- Debt Chasing and other letters
- **Aged Debt Analysis**
- Statements (User Definable)
- Re-Occurring Transactions,
- Receipt/Payment/Refund
- & Contra Processing
- Invoice Search Facility
- RISCOS multi tasking
- Text Editor
- Trial Balance Quick Ratio
- VAT Return
- Profit/Loss & Balance Sheet Self re-building data files
- Hold transaction or Account
- Miscellaneous Accounts
- Upgradeable
- Full Support included
- Mouse or Keyboard Driven

#### KENDAL COMPUTER CENTRE

68 Stramongate, Kendal, CUMBRIA LA9 4BD Tel: 0539 722559

Arcounts Manager is the ultimate Archimedes Accounting system on the market today. It is not written to run under an emulator and is not ported from another machine, it simply takes full advantage of the raw power of the Archimedes and A3000 computers to ensure that the computerisation of your accounts is as simple as possible)

Aregunts Manager is very simple to learn and use, data entry is clear and logical, reports are concise and to the point.

Because Arcounts Manager puts you in control of your finances, it can greatly improve your cash flow, as well as perform the traditional functions such as VAT returns and Profit/Loss reports.

Priced at only \$299.00 +VAT, there is really only one choice if you are serious about computerising your accounts. Contact your dealer for a demonstration TODAY.



Boldon Business Park, Boldon Colliery, England.

#### DESKTOP VIDEO

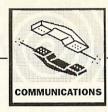
A wealth of tantalising possibilities exist for using your Archimedes with video. It's a combination which has applications in home or professional use, at school, in science or in industry. Wild Vision offer a range of hardware expansions perfect for every DTV need, including:

- Video Digitising the Hawk V9 is the longest established real-time colour digitiser on the Acorn market. Easy for those 'in the know' to see why it remains so popular.
- Video genlocking overlay computer graphics on live video.
- PAL encoding record your computer's output on video
  - Multiple display of your computer screen.
    - Image processing a range of video framestores and software are available for

Data acquisition using Wild Vision's l speed analogue to digital converters Wild Vision are working from a platform expertise, developed over time through specialisation and commitment to quality ...

.. "DESIGNING WITH PROGRESS IN MIND"

Plus: Exciting new expansions for the A3000 and Archimedes are on the way. Contact us at the address above if you'd like to be kept informed of new developments in Wild Vision's range.



# **CHANGES AT BT**

A NUMBER of changes are being made by British Telecom which will affect comms customers

The first is that, as of September 2, reduced telephone rates for high usage mean that, according to BT, 'the more calls you make, the greater the savings'. When you spend over £117.50 per quarter on your telephone bills, you qualify for a 5 percent discount on future calls. These savings can go up to 8 percent when your bill reaches £293.75 per quarter.

It is a pity that BT cannot offer discounts to users with lower phone bills, instead of encouraging people to run up even higher bills, but those of you who do a lot of communicating may end up with reasonable savings.

The second major change is set for April 1994. As revealed in this column a few months ago, BT applied to add an extra digit to all telephone exchange numbers. Oftel has finally announced its decision to allow BT to add an extra 1 after the initial zero on all national dialing codes.

This will only affect calls made to places outside your local area, but will require communications software to distant BBs to be changed.

For further information on these changes, call free on 0800 800 873.

 STOP PRESS BT has decided to discontinue the Micronet service. It will close down at the end of this month.

Current subscribers (thought to number around 15,000) will be offered low cost-entry to Compuserve (the Americanbased network).

Watch out for further details in next month's BAU.

#### ANTI-HACKER DFVICE

IF YOU run a computer network and are worried about hackers gaining entry to your system, take a look at DAS 2 by Kerridge Network Systems. It consists of a single unit which sits between your modem and computer and only allows access in to specific coded systems.

Up to 400 users can be programmed in and multiple levels of security should help to ensure that any potential hackers are kept at bay.

As the unit is installed between the RS232 port and modem, it is not machinedependent, so it should work with most computers.

 Speaking of hacking, this is a problem which crops up in many contacts I have with fellow comms enthusiasts. I'm always interested in your views, so do drop me a line.

#### **NEWS IN BRIEF**

- DUE TO unforseen circumstances, Mad Rabbit BBs has stopped operation, However, development of Joel BBs is underway and on schedule for release in January 1992. Mad Rabbit systems is also developing an Archimedes Viewdata host system called Questor. No release date has been set, so watch this space for news.
- JAMES COATES of Procrastinet fame has created a new BB, which he hopes ex-users of Procrastinet will call on (0568) 612118 (viewdata).
- If YOU are interested in astronomy, space exploration or just physics in general, then Starbase 1 may be just the BB you are looking for. Based in London, it offers lots of text files and information databases on a wide range of scientific subjects, most with an astronomy flavour. It also has numerous Acorn Archimedes and BBC files to download, Call 071-733 3992 with your comms software set to scrolling 8N1.
- ATLANTIS BB. the bulletin board run by Olly Tseliki, is back on-line after a move to the south coast. Atlantis is now based in Brighton and can be called on (0273) 696060 (300/1200/2400/ 9600/HST).
- IT HAS come to my notice that at least one bulletin board is running on a premium rate telephone number such as 0898, yet makes no announcement of the fact, advertising free downloads and messages. I believe that it is now under investigation, but it is worth double-checking any exchange codes before you log on to new bulletin boards. If you are unsure, it is worth checking the code with one of the numerous PD phone code locators available.
- MANY BB host software packages allow the Sysop (system operator) to patch in Basic programs to integrate with the board and provide on-line games, databases, call loggers and similar. If you are a Sysop and you are particularly pleased with an external program you have written to support your BBS, please write to me, c/o the BAU editorial address, giving details of your program and why you decided to write it. The best ones I receive may even be featured in this column. See you again next month.

Paul Vigay

#### **BB OF THE MONTH**

THIS month's featured bulletin board is run by Steve Pursey in London. It runs on a BBC using the popular XFS+ host software. Catering for a wide range of interests and users, it has numerous specialities including a separate 'gateway' to another bulletin board and a wide range of downloads.

Special interest include music, showing the pop charts, For Sale and advertisement sections, as well as a comprehensive, on-line games section. Indeed, the range and on-line games variety of available is quite surprising and worth a look on its own. As well as simple games such as Noughts & Crosses and Hangman, there are no less than three full adventure games, a Colditz game, a Business game and Eliza. The latter is a popular classic based







on artificial intelligence where you have a conversation with a 'computer psychiatrist'. It can be great fun, so try key 16 from the main menu.

Active mail areas cover a wide range of subjects, from advertisements to special interest. An on-line database of telephone exchanges is also featured and a debate area encourages views on current news items. The BB is on viewdata (all speeds up to 2400 baud) on 081-903 1309.



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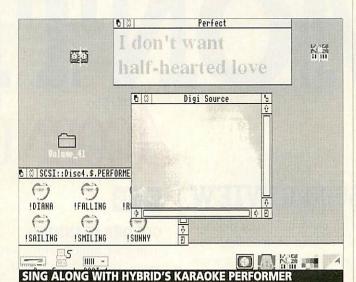


# **NOW IT'S ARC KARAOKE!**

IT HAD to happen. The Karaoke craze has finally hit the world of Acorn, in the shape of Karaoke Performer from Essex-based music company, Electromusic Research. Described as 'a new dimension in home entertainment', the Karaoke Performer package an Archimedes/ includes A3000 or BBC floppy disc as well as an audio cassette containing six professionally produced backing tracks.

The song lyrics scroll in various ways on the computer screen, following the song on the tape. The control program also allows a separate graphics program or video controller to be used to make original backgrounds during the performance. One free graphics animation is provided with each Karaoke set.

Over 90 sets are available. including hits from the 1950s



to the 1980s by well-known artists. Each Karaoke set costs £10 plus £1.50 p&p.

To supplement the Karaoke Performer sets, EMR is also marketing a customised Karaoke performance unit with echo microphone, mixer and amplifier/speaker system which costs £69.

For further details contact EMR, 14 Mount Close, Wickford, Essex SS11 8HG. Tel: (0702) 335747.

## EASY ACCESS

A NEW method of connecting multiple peripherals to the Archimedes range of computers has been developed by Hybrid Technology.

AccessLink peripherals plug into the printer port, overcoming the restriction of the user and serial ports which only allow one device to be connected at a time.

ArcRecorder is the first AccessLink-compatible duct and costs £32.95. Others will include the Access 2000 Touchscreen at £179 and the Access 1000 Interface at £49. These prices do not include the AccessLink power unit.

The company is also preparing a special needs ArcRecorder pack, containing two applications: VoiceBox amplifies the user's voice with echo. pitch change, delayed talkback, and 'dalek' effects; SpeakEasy encourages users to speak, with a visual 'reward'.

Contact Hybrid Technology on (0223) 861522 for more product information.

#### BEEB INTERFACING

A READER from Luton, P Hill, has written to ask me what packages are available for the BBC micro to drive a Midi interface, the intention being to control both a synthesiser and drum machine.

First of all, it's worth mentioning that a Midi device and a 'driver' are separate entities. Most Midi interfaces for the Beeb were developed alongside specific software and while one interface might well work another application, your best bet is to stick to the intended pairing.

There are four main contenders. EMR's Midi interface costs £79.90 and complements a variety of sequencing and voice editing software which ranges from £30 to £130. EMR often has bundle deals comprising the interface and selected pieces of software. EMR, 14 Mount Contact Close, Wickford, Essex SS11 8HG. Tel: (0702) 335747.

The U-Music programs were originally designed for professional use. There are two main packages, both of

which include a Midi interface. Prices range from £200 to £600. For more details you can contact U-Music, 17 Parkfields, London SW15 6NH. Tel: 081-788 3729.

Hybrid Technology has a Midi interface, the Music 2000, for its Hybrid Music System. You will also need the core module of the system, the Music 5000. Both cost £140.

The software does not support direct input from a Midi keyboard although routines have been developed to help with this problem. You can however, record on the system with the optional Music 4000 keyboard which costs £147. More details from Hybrid Technology, 88 Butt Lane, Milton, Cambridge CB4 6DG. Tel: (0223) 861522.

ESP's Midi interface, the K1, was specially designed for use with the ESP's popular Compose, Compose Play and Rhythm Maker programs and costs £55. Contact ESP, Holly Tree Cottage, Strelley Village, Nottingham NG8 6PD. Tel: (0602) 295019.

#### **NEWS IN BRIEF**

- CLARES seems to have taken music making on the Arc very much to heart. Hot on the heels of Rhapsody 2 comes Vox Box, a suite of four programs: Perform lets you play Rhapsody and Midi files; Vox Beat is a drum pattern creator; Vox Sample converts samples into useable Arc voices; and Vox Synth lets you create sounds using digital synthesis. Both packages cost £53 from Clares, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7DA. Tel: (0606) 48511.
- EMR has been busy over the summer months. Apart from its Karaoke Performer package, the company has produced a number of file conversion utilities. These will allow music from various sources to be played in Studio 24 Plus and MicroStudio.

The Maestro converter converts Maestro files, removing the 'garbage' which sometimes appears in them. The Sound-Tracker converter does the same for SoundTracker files, and you can also load drum patterns created in EMR's Rhythm Box. The Midi File Format converter will convert most Midi file data including Rhapsody files. It should also be able to convert files from other machines via MultiFS.

At £13 Modern Music 3 is the latest EMR music disc. It contains seven pop songs, and you will need EMR's MicroStudio, Music Player or Studio 24 Plus v2 (or later) to access it. The pieces are configured for Roland's MT-32/CM modules but can be used with any multi-timbral instrument. Studio 24 Plus is now at version 3. New features include unlimited track recording, a link into the EMR Scorewriter program and some special sampling effects.

StoryBook has new features including support for multiple input devices, and subjects can be animated on the screen. It requires 2Mb of memory and costs £59. For more details contact EMR on (0702) 335747.

- AS REVEALED in last month's main news pages, the dispute over the ArcRecorder name has been resolved. Oak Solutions is calling its product Oak Recorder.
- IF YOU HAVE any music news write to me at BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ.

Ian Waugh

# NEXT

# CORNUSER

### **A5000 REVIEW**

The new Acorn A5000 with its Arm3 processor and Risc OS 3 sounds like a fascinating machine – but what is it like to use? Don't miss our review

#### SHOW ROUND-UP

The BBC Acorn User Show will be the launchpad for a host of new products for the A3000 and Archimedes. Look out for our full report

#### PINPOINT

*Pinpoint* is the new data collection and presentation software package from Longman Logotron. We put it through its paces

#### **IMAGE ANALYSIS**

A fascinating insight into how one Archimedes user does some clever things with high-resolution images

> Watch out for the December issue of BAU - available November 14 1991

#### PLUS

#### COLOUR SCANNING

You can import colour images into your machine using one of the latest hi-tech, low-cost, colour scanners. We look at the options

#### STEPPING UP

Following on from our successful First Steps series, we continue our tutorial series on useful applications for the BBC A3000/Archimedes

#### **FACTORY**

ESM's Factory allows children to design complex geometrical shapes. We see how it works

#### REGULARS

- All the latest news and views from the world of Acorn
- ★INFO helpful advice and ideas covering the BBC A3000, Archimedes, BBC B and Master
- Your letters and problems
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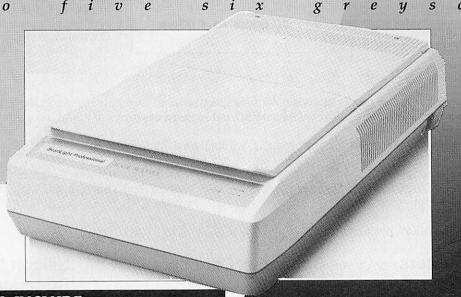
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# Scanlant Scanlant

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#### FEATURES INCLUDE:

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A professional quality 256 greyscale flatbed scanner for the Archimedes.
A new addition at the top of the ScanLight range for those wanting the best possible scan quality available.
Suitable for professional image setting and DTP work taking the Archimedes another step towards being the ultimate DTP solution.

- SCSI interface for the fastest possible scan times
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Enhanced ScanLight Plus software offers

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4Mbytes min RAM requirement. £899 + VAT (£1056.32 inc) for scanner cable & software. £999 + VAT (£1173.82 inc) including suitable SCSI interface board.



Computer Concepts Ltd

The flatbed scanner for the Archimedes

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# Watford Electronics presents .... Winter Hands-On Open Day

Sponsored by : The Micro User and BBC Acorn User



# To Be held at: JESSA HOUSE on SUNDAY 1st December 1991

10.00am to 4.00pm

#### SALES ADVICE

Watford Electronics Technical and Sales personnel will be on hand to discuss all your technical queries and computer requirements. Come and see live demos of popular BBC / Archimedes Software, Hardware and Watford Electronics own range of PC Compatibles.

Yet another chance to bring the family and visit Watford Electronics to watch, learn, and talk to other like minded enthusiasts, experts and novices on the subject of Acorn BBC and Archimedes range of home computer systems.

Hardware and Software - Amongst various products, we shall be demonstrating our NEW ...

Archimedes Hard Card Archi COLOUR Hand Scanner Aries Alphascan Monitor Archimedes Hi-Res Graphics Card Archi Real Time COLOUR Digitiser ARM 3 Upgrade - for A300/400 and A3000

Also appearing will be **NEW** products from:

Acorn Computers
Minerva
Colton Software

Computer Concepts
Taxan UK
Panasonic UK

Silicon Vision Superior Software

#### **Technical Support**

- Watford Electronics: Our technical team will be available to discuss any technical queries and offer advice.
- BBC Acorn User: Contributors and the editorial team will be at hand to answer all your questions.
- The Micro User: Mike Cook will be available to help and advise on matters related to BBC/Master.
- Gordon Taylor: The renowned Archi 'Guru' and technical writer will be available to advise on matters related to Archimedes.
- Acorn Computer's representitives will talk about proposed new products and answer all yours questions.

#### **Educationalist support**

- A private area allocated to the specialist in education will be provided.
- Staff will be on hand to talk about current trends and requirements in the educational sector.
- Watford Electronics Managing Director, Nazir Jessa, will be happy to discuss special deals and packages for individuals & educational establishments.

#### Instant Finance available up to £1000

Purchases can be made at the Open Day and Instant Credit deals will be available via Lombard Tricity Finance Ltd (subject to status). Extended finance over 36 months on any purchase over £300 + VAT (APR 36.8%). Identification will be required, ie Driving Licence, Credit Card and Bank Card. A deposit of 10% of your purchase is all you need to pay on the day.



#### £15 STAR LETTER

I am beginning to wonder if I am the victim of a con trick.

Last year I decided to take the plunge and buy a BBC A3000. I realised that I was going to need a wordprocessor and was interested in the Genesis program, so I decided to purchase a Learning Curve package which included both of these items, and a PC Emulator as a 'bonus'.

There was no warning to potential purchasers that they were buying software which, although it was functioning perfectly well, would have no real value when any upgrades became available.

Having made extensive use of Genesis, I now wish to upgrade to Genesis II, but find that because I bought a Learning Curve package, rather than separate software, my existing package is worthless in terms of an upgrade.

I feel that potential purchasers of the LC package should at least be warned that the Learning Curve special offer may not be so special in a year's time.

Richard Still Lincoln

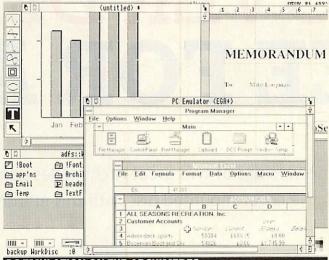
#### DEALER APPOVAL

It was sad to read Mr Conridge's letter (BAU October issue). Is there anything that can be done to help your readers. I think there is.

Let us first define what a 'good' Acorn dealer should be able to offer its personal (meaning not mail order or telephone) customers:

- A showroom in which they can serve their customers
- Demonstration hardware on display and available
- A reasonable selection of software and books in stock, including examples in all main categories - for example, business, games or education
- Knowledgeable staff available to give information on products, including those that are not normally stocked, and to give advice and solve the users' problems.

If this list of criteria is agreed, it should be published in BBC Acorn User and dealers should be invited to



PC EMULATION ON THE ARCHIMEDES

nominate themselves to be added to a list of BAU 'approved dealers'. When a sufficient number of dealers have responded, the list of dealers could be published in the magazine.

The benefits of the scheme for dealers would be an opportunity to promote themselves as a cut above the average. For the customer, it would provide a list of dealers to depend on for decent service.

**David Coronel** The Data Store Bromley, Kent

Of course, Acorn already has a list of approved dealers, and sets down criteria which they have to meet. That does not mean that an independent approval system could not work - we would like to hear other readers' ideas and views on the subject.

#### WHY EMULATION?

A question that puzzles me, and I am sure many other Acorn addicts, is why it is necessary to use emulators when we want to run some piece of software that was not written for our own computer.

Many programs that people use in offices are made for the IBM PC or its clones and it would come in handy if this software would run properly at

The existence of PC emulators proves that it is possible to read and run PC programs, but why must they be so slow? Is it possible to, instead of reading and running a program,

read and translate it into Arm code first, save the translation and run this code from that moment on? This would be a giant time saver, wouldn't it?

Roel Boesenkool Netherlands

Translation into Arm code would be very complex and it would be necessary for each piece of software you use. You have to weigh up the advantages of using PC software against the relative speed, which is not so slow as to be unusable, especially with the Arm3 processor.

#### **BIG LEAGUE**

Why is it, I wonder, that Acorn is not a major league computer company? The machines it produces are unrivalled, yet, in all the offices and banks and shops that I go to, all the computers are either IBMs or Apple Macintoshes.

Apple is an accepted business computer because Apple launched a massive sales campaign and worked closely with software houses to produce a viable business package.

PCs are popular because IBM was very much in at the start, and it also makes highend computers which have long had a reputation for reliability and solidness. But why does nobody seem to realise that the Acorn machines are more reliable still?

My early BBC micro is still running and has no problems whatsoever, and my Archimedes, which is up and running for most of every day, has

not developed any of the irritating mouse glitches that plague other machines.

Maybe if Acorn was to sort its sales strategy out, with proper business packages offering on-site maintenance and useful software, they would be accepted by many more people.

> **Gavin Sallery** Herts

Acorn is number five in the league of UK personal computer suppliers, so it is hardly an 'also-ran'. The new A5000 is the company's attempt to hit the very markets that you suggest.

#### LOSING THE BATTLE?

Although some very sophisticated software packages are appearing for the Archimedes, I am afraid that it is in danger of losing the battle to be treated as a serious machine, unless some of them follow the direction taken by some of the more heavyweight software for the PC.

It would appear that the trend is now towards databases and so on, which are programmable. This means that it is possible to write software tailored to one's own specification by writing an overlay for the main package which does all the work. The art of programming is shifting from programming from scratch in Basic, C or assembly language, to writing much more sophisticated software, with much less effort, on one of these packages.

Ironically, this technique was pioneered a number of years ago by Computer Concepts, with Wordwise Plus on the BBC B.

> Martyn Fox Windsor, Berks

#### BAU – GREAT VALUE!

I have just bought the October issue of BBC Acorn User with the free cover-mounted 3.5in disc. Do you intend to continue with these?

John Lee Birmingham

Our sales will dictate this. Let us know how much you would be prepared to pay for a disc, on top of the current cover price.

# COVER DISC FREE FOR ALL!

Demo versions of two great Archimedes games, FREE on the cover-mounted disc with this month's issue

et's go! One lemming, two lemming, three lemming, four... Out they come and off they go. Over a cliff, in for a swim and even under a lead weight of considerable tonnage if given the opportunity.

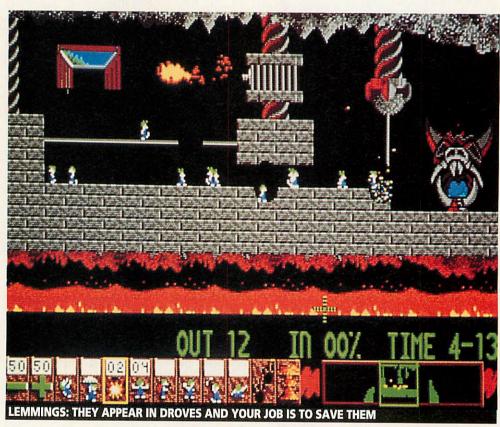
These are the sort of sights you see if you play the exclusive demonstration version of Lemmings from Krisalis Software, which is on the free cover-mounted disc with this issue of the magazine.

But this isn't the only game you'll find on the disc. The Fourth Dimension has also prepared a special mission for its Tiger Moth flight game. Chocks Away, exclusively for our readers.

#### LEMMINGS

In the interests of lemming conservation, here are a few tips on what to do when the trapdoor opens and the first lemming drops out.

The object is to save as many lemmings as possible. All you have to do is ensure that a safe route exists between the trapdoor and the exit, then the lemmings just follow this and they're home. The information screen, which is displayed just before play commences, will tell you how many lemmings you actually need to save on that particular level. The next information screen, displayed just after you have played, tells you how many lemmings you have managed to save.



You will notice a pair of crosshairs somewhere on the screen, that you can control by using the mouse. The crosshairs are actually a way to influence the lemmings. Point at a lemming and click using Select. The effect this has depends on which of the lemming-jobs is selected.

The jobs selection area is the row of icons along the base of the screen. Ignoring the minus and plus signs for the

moment, the icons represent the following jobs. From left to right: the climber icon makes a lemming climb the moment it reaches a vertical wall. It will then keep climbing until it either gets to the top or dies trying.

Next is the parachute icon. Any lemming can be given a parachute by clicking on the lemming while this icon is selected - any time before it hits the ground. The adjacent

explosion icon can be used for disposing of an unwanted lemming. There are times when they don't help matters and the best thing for them is a dose of self-combustion. Again, to make this happen select the icon and then click on the doomed lemming.

Moving on, the blocker icon is used to stop a lemming in its tracks. Not only that, but any more lemmings coming upon a blocker will be turned back the



other way, so they can be very useful if placed just before some sort of hazard. The drawback is that the only easy way to make a blocker stop blocking is to blow it up.

A builder can be spotted a mile off because of the Santa Claus-style sack slung over its shoulder. A builder will build diagonally up for a few seconds and then stop and proceed to walk over the edge of its creation, unless you turn it back into a builder first. Useful, but you have to keep an eye on them.

The final three icons are bashers and diggers and miners, excavating in the horizontal, vertical and diagonal directions respectively. A lemming made to dig will continue going until it reaches open space or something solid. If you want a lemming to dig then you have to click on it just before it reaches the spot where you want the hole.

Finally the last two icons are the 'pause' icon and the 'mushroom' icon. The pause icon is self-explanatory and the mushroom icon is the one you use when it all goes wrong. Note its distinct resemblance to mushroom clouds - it is used for total lemming destruction.

You can use the square outline that covers part of the map-diagram (bottom right) to alter your view of the play area. The plus and minus signs mentioned earlier simply affect the rate at which lemmings fall from the trapdoor.

So, go on - save those lemmings. The full version of the game can be obtained from Krisalis Software but don't forget that you could win a copy by entering the competition in the Games Supplement in this issue.

#### **CHOCKS AWAY**

Generally speaking, people who buy games only refer to the instructions once they have discovered how not to play the game. The good thing about The Fourth Dimension's Chocks Away is that it is simple to play, but somewhat trickier to master.

Load it up and you'll see what we mean. After the flashy, backward-flying demo that skims you across the landscape at Mach 2, (twice the speed of sound), you'll find yourself sitting squarely in front of an ancient red cockpit with dials and a very clean window - or, to be more precise, no window.

Try this: hold down the left hand CTRL key with one finger and, with a combination of your other fingers that you find nice and comfortable, get ready with z. x. " and 2. You'll hear the engines start and then the world will begin to move backwards all around you, although it will probably seem more like you are moving forwards! When you reckon you're going fast enough to take off, press down the ? key and the nose should rise.

At some point you should probably let go of the CTRL key, if you haven't already done so. It will just end up making your fingers ache. Now you're airborne, and reading at the same time - such talent. This is the time to familiarise yourself with the controls. Gain a bit of height, then experiment with z and x, which roll the aircraft, " and ? which affect the pitch, and RETURN, to let rip with your one and only weapon.

This version of Chocks Away has been specially prepared for BBC Acorn User and

there is only one mission. which is actually a pretty hard one. Pressing M will take you to the map screen where you are likely to spot three flashing dots. The mission? Roast those dots! Well, technically speaking they represent a weird plane with a foreign name or a couple of barrage balloons but. the point is, you should try not to stray from the real targets.

It is the dots that make the mission. Killing the numerous baddies who fill you with flak only boosts your score and gives you peace. At the end of the day, those dots must die! Stick to the task in hand before taking on the other guys. Of course, they may not feel the same way about you. The mission is completed when the dots are no more and you safely land on the runway.

The full version of Chocks Away allows two players to fight each other or work together on the mission, using a split screen. You might want to try out, even on this demo version, the various viewpoints from which you can see your plane. Toggling the ENTER key is the simplest way to do this. but it is more fun to use function keys F5 and F6 and use the cameras. Try it all out yourself, and have fun!

The full Chocks Away, with 20 missions, can be bought from The Fourth Dimension, which also produces an Extra Missions disc with 26 new missions. To play the Extra Missions you will need to buy Chocks Away first. A Chocks Away Compendium pack. comprising both packages, will set you back £39.95.

#### PRODUCT DETAILS

- Product: Lemmings
- Supplier: Krisalis Software, Teque House, Masons Yard, Downs Row, Moorgate, Rothham \$60 2HD. Tel: (0709) 372290
- Price: £25.99
- Product: Chocks Away
- Supplier: The Fourth Dimension, 1 Percy Street, Sheffield S3 8AU. Tel: (0742) 700661
- Price: 24.95
- ★ Both game demos will run on the BBC A3000 and Archimedes only.



I have recently bought a Q Tandy WP-2 portable computer which I intend to use with my BBC Master 128. Unfortunately I am experiencing some difficulties with the transfer of data between the BBC and the Tandy. The salesperson told me the transfer was very simple.

> Ann S Fariah Maryport, Cumbria

A Despite what you been told by Tandy, the Despite what you have transfer may not be quite as straightforward as you have been led to believe. Your problem could be one of not correctly setting the baud or data parity to match on both machines. Or you may need to run some kind of communication package on the BBC to enable you to transfer text between the Tandy and the BBC. I would start by ensuring that the two machine are configured to match.

Q I am an artern user on the BBC Master I am an ardent ViewStore 128. However I have two ViewStore datafiles that I wish to join together into one file. Is this possible? I would hate to think that I would have to retype one of the files again.

H. Manor East Mosely

The format of ViewStore datafiles enables them to be quite easily manipulated by BBC Basic. The following program could

# QUESTIONS ANSWERS

probably be used, with some amendments to append the two files to one another. Do remember, it is essential for the field order of both files to be the same for sensible results.

10 INPUT "File 1 ";file1\$

20 INPUT "File 2

";file2\$

30 one=OPENUP(file1-

40 two=OPENUP(file2-

\$)

50 REPEAT UNTIL BGET#one=1

60 PRT#one=PTR#one-1

70 REPEAT

80 byte=BGET#two

90 BPUT#one, byte

100 UNTIL byte=1

110 CLOSE#one

120 CLOSE#two

I know that you can use the HP DeskJet printer with the Acorn PrinterLJ printer driver. It is not, however, totally successful, as I do have some trouble with the margins settings. Can you recommend anything I could do to get suitable margins.

D Harvey Ichen

You can set the margins A You can set .... from the page size box, which is available from the main printer driver menu when you click the centre mouse button over the driver icon. I would you suggest that you try the following settings:

Top: 2mm

Bottom: 10mm

Left: 3mm

Right: 4.2mm

If you experience difficulties, with a small part of the page you are printing appearing on the next page with certain programs you should adjust the bottom margin to 11mm. This is because some programs print right to the very bottom of the printable area.

I find it amazing that the programmers responsible for writing Edit for the Archimedes and BBC A3000 failed to provide a command for toggling between overtype and inset. Is it just bad programming or have I missed something?

P Barnett York

A The documentation in the user guide does not provide enough information about Edit so you can be forgiven in thinking that the facility is not there. If you try SHIFT-FI you will find this will let you toggle between overtype and insert.

With some luck, I have acquired from work an 80-track IBM compatible disc drive without a PSU which I would like to connect to my BBC Master 128. Is this possible? Will disc drives designed for other computers work with my machine? Please can you advise?

> Phillip Brooke Hourtou, France

A It is quite likely that the disc drive that you have acquired is compatible with the BBC Master series of computers. As the BBC will only supply 1.25 amps at 12v and 5v you may find that the disc drive you require needs a stabilised power source. You should be able to purchase one of these in France,

#### POSTING YOUR PROBLEM

If you have a particular problem with an Acorn micro, commercial software or a program you are trying to write yourself, then BBC Acorn User might be able to help. The BAU Post A Problem service guarantees to give you a personal answer to your problem within 10 working days - and for just £4.

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as you will at least be looking for an IBM-compatible disc drive power supply rather than a BBC computer one.

To operate with the BBC, the disc drive will need a 34way flat ribbon cable to connect between the drive and the BBC. Usually the disc drive end is a standard connector used on all drives, whether BBC or IBM PC.

Although I have a Archimedes 310 upgraded to 4Mb. I still experience problems with the amount of free memory available when I use the Acorn PC Emulator. Can you offer any guidance?

> **B A Haines** Littlehampton

I think the reason that A junik the real junion was little memory free is that you are entering the Acorn PC Emulator from the Desktop. This is because the Desktop is only allocating 640K to the emulator, including all that used in the emulation program itself. To get round it and to aid quicker loading create this Obey file:

WimpSlot -min 1024K

-max 1024K

Dir :4.\$PC

Run Emulate

Replace the directory in Line 2 with the directory of your emulator if necessary.

This file should be Run and placed inside an application directory, whereupon double clicking on the application icon will run it.

I hear that you can now purchase removable hard disc drives for the Archimedes and BBC A3000 computers. Can you tell me any more about them? How do you connect them to an Archimedes computer and are they fast, reliable and robust?

> Mark Gill Reading

A You are quite right -removable hard drives are available from a number of companies. Norwich Computer Services, at 98a Vauxhall Street, Norwich NR2 2SD, supplies the MicroNet MR45 removal hard drives, which have to

be used with a SCSI card when used with the Oak SCSI card they are fast average access time is 25 milliseconds.

The MicroNet drives are certainly reliable, having been successfully used for some time on the Apple Macintosh range. The discs. when not in the drives, are extremely robust. It is possible to throw one across the office or drop it on the floor and it will still verify fully. although this treatment is not recommended!

On a BBC B, how do you Q On a BBC B, its of the find the address of the first free byte after a program's variable storage area?

**Steve Santon** West Bromwich

This information is stored in bytes &02 and &03 of zero page. Do remember that if you attempt to access this information as a hex number, any leading zeros will be left out. So, to access the value correctly in hex, use:

vartop= (?2+?3\*256) NB - is the tilde character

I am still using the Acorn Q Tam sun danig Desk Top Publisher program, which I find meets my simple DTP needs well. I find in certain instances that the space between letters looks wrong. Is there anything I can do about this?

> Harriet Marks Wolverhapton

A The space between letters, called kerning, can be adjusted using the Kern command from the Text edit menu or by pressing CTRL-K. The first of these lets you set the kerning by adjusting it up and down by an amount measured in points. CTRL-K decreases the kerning between two letters by half a point. Be careful when using this command as sometimes kerning looks wrong on screen when it isn't. It's a good idea to check the kerning in double size or you may find what looks right on the screen is wrong when printed out.

#### ACORN CUSTOMER HOTLINE

The 1.60 multitasking PC Emulator has now been released for a couple of months and we would be interested to hear from users about their experiences with software that will run or will not run. We can then look into problems of software not running and compile a list of software that will run to help future customers. If you are intending to send us some information on PC Emulator compatibility please provide the following information machine type, the amount of memory, the version of DOS being used and the version of the application being run.

The address to send the information to is: Customer Services, Acorn Computer Limited, Fulbourn Road, Cherry Hinton, Cambridge, CB1 4JN. Please mark your envelope 'PC Emulator'.

We still receive a large number of enquiries regarding printer drivers. The printer driver we get most enquiries about is PrinterDM. The PrinterDM application provides a number of different printer emulations which are:

- EPSON LQ compatible (Low) (60 by 60dpi)
- EPSON LQ compatible (Medium) (180 by 180dpi)
- EPSON LQ compatible (High) (360 by 180dpi)
- EPSON FX compatible (Low) (60 by 72dpi)
- EPSON FX compatible (Medium) (120 by 144dpi)
- EPSON FX compatible (High) (240 by 216dpi)
- EPSON LQ-850 compatible (Very high) (360 by 360dpi)
- NEC PinWriter P6 plus (Very high) (360 by 360dpi)

It is necessary to ascertain which printer driver within PrinterDM is compatible with your printer, select that printer driver and then use the 'save choices' options on the PrinterDM menu to ensure that next time you start up PrinterDM the correct driver is automatically selected.

The different printer drivers are selected by clicking with Select button over the !PrinterDM icon when loaded into the machine. After clicking, a dialogue box will appear which contains the name of the printer driver selected. Clicking over the name of the printer type with the Select button will cycle through the different printer drivers available.

Hard discs are becoming more and more popular for all machines as time goes on. With a hard disc installed it becomes much easier to build a system which starts with various applications you always use ready loaded. The following information will allow you to load in whichever applications you like when you Crfirst start the Desktop. An example of this is below.

Create a Text file using Edit, and type in:

Filer\_OpenDir adfs::Disc.\$ Run adfs::Disc.app1.!System.!Boot Run adfs::Disc.app1.!Draw.!Boot Run adfs::Disc.app1.!Paint.!Boot Run adfs::Disc.app1.!Edit Run adfs::Disc.app2.!Alarm Run adfs::Disc.app2.!TinvDir Run adfs::Disc.app2,!Magnifier The name Disc is assumed to be the name of your disc. Save this as DeskTasks in your discs root

directory. Now add the following line to the end of your Boot file create a boot file with this line in it:

\*Desktop -file adfs::Disc.DeskTasks

Now ensure you have saved all edited data and CTRL-BREAK your machine. Your boot sequence will execute, there will be a short pause, and then you will enter the desktop with your Disc's root directory open, with Edit, Alarm and TinyDirs running, and Magnifier loaded into TinyDirs.

If your machine does not boot ensure your configuration is set to BOOT, and the disc's OPT 4 setting is correctly set for the type of boot file you have.

What has happened is that the \*desktop command has run each line of the DeskTasks file as a task within the window world. System.!Boot must be run before Edit is run: this is equivalent to System being 'seen' in a Filer directory viewer, and tells Edit (and anyone else who needs to know) where system resources can be found.

Note that all applications are quoted with their full path-name, including filing system name and drive name or number. It's an important principle of operation on the desktop that, as far as possible, all objects are identified by a full path-name, and so access to them is unaffected by changes of the current directory, drive, or filing system.

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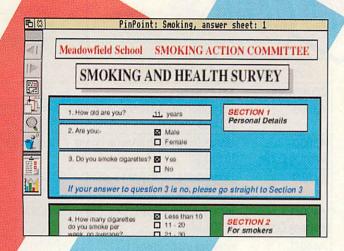
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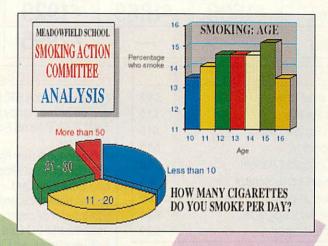
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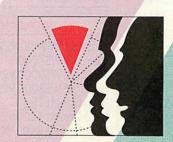


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| HP Laserjet III           | 8   | * | £1025 | Qume Crystalprint          |     |   |             |
| HP Laseriet IIID Dual Bin |     |   |       | S/Series II                | 6   | * | £105        |
| Duplex                    | 8   | * | £1740 | Quine Crystalprint         |     |   | de la serie |
| BM 4019E XL               | 5   |   | £735  | Publisher PS 2Mb           | 6   | * | £154        |
| BM 4019 XL                | 10  |   | £990  | Star LP-4                  | 4   |   | £67         |
| Kyocera F800T             | 8   | * | £934  | Star LP-4PS Postscript     | 4   |   | £83         |
| aser Direct               | 6   |   | £844  | Star LP-8 III '            | 8   |   | £95         |
| NEC Silentwriter 2 S60P   |     |   |       | Star LP-8 III Starscript   |     |   |             |
| P/Script                  | 6   | * | £1100 | P/Script                   | 8   | * | £118        |

All printers marked by an \* include 12 months on-site maintenance.

#### **MONITORS**

SPECIAL OFFER 14" Multiscan Hi-Resolution 0.28 Dot Pitch, 1024 x 768 \$24.7

| MICROVITEC                  |         | NEC                                |      |
|-----------------------------|---------|------------------------------------|------|
| 1431 Standard Resolution    | £165    | Multisync 3D 14" 0.28 Dot Pitch    | £334 |
| 1451 Medium Resolution      | £199    | PANASONIC                          |      |
| 14M325 (CUB 3000) Medium Re | s. £179 | 14" Super Hi-Res 0.29 Dot Pitch    | £232 |
| 1441 High Resolution        | £349    | TAXAN                              |      |
| 2040CS 20" High Resolution  | £659    | 770LR 14" 0.31 Dot Pitch Low Rad   | £375 |
| Touchtec 501 Touch Screen   | £234    | 775 Plus 14" 0.28 Dot Pitch Hi-Res | £373 |
| PHILIPS                     |         | 795 Trinitron 0.26 Dot Pitch       | £415 |
| BM7502 12" Hi-Res Green     | £68     | 875 17" 0.26 Dot Pitch             | £718 |
| CM8833/II 14" Medium Res    | £167    | VIDC Enhancer Board                | £24  |

#### **PRINTERS**

#### FREE Parallel Printer Cable With All Printers

| Canon BJ10e Portable    | £187               | Llow/Dagle Desg AV/sibout               |        |
|-------------------------|--------------------|---|--------|
| Canon BJ300*            | £350               | Hew/Pack Rug/Writer* IBM Proprinter 24P | £929   |
| Canon BJ330*            | £397               | IBM Series II 2380                      | £220   |
| Citizen 120D+           | £99                | - IBM Series II 2381                    | £280   |
| Citizen 124D            | £145               | IBM Series II 2390                      | £349   |
| PN-48 Portable          | £208               | IBM Series II 2390                      | £320   |
| Swift 9                 | £141               | IBM Quickwriter 5204                    | £380   |
| Swift 24                | £204               |   | £490   |
| Swift 24X               | £293               | IBM Execjet 4072                        | £446   |
|                         | L273               | Integrex Colour Jet                     | £499   |
| EPSON                   |                    | Mannesman Tally MT81                    | £91    |
| LX-400                  | £108               | Nec P20                                 | £179   |
| LX-850                  | £147               | Nec P30                                 | £219   |
| FX-850                  | £278               | Nec P60                                 | £329   |
| FX-1050                 | £358               | Nec P70                                 | £408   |
| DFX-5000                | £1089              | Nec P90                                 | £550   |
| DFX-8000                | £1995              | Panasonic KXP1180                       | £100   |
| LQ-200                  | £175               | Panasonic KXP1123                       | £138   |
| LQ-450                  | £179               | Panasonic KXP1124i                      | £182   |
| LQ-570                  | £217               | Panasonic KXP1695                       | £283   |
| LQ-870                  | £376               | Panasonic KXP1624                       | £283   |
| LQ-860 Colour           | £461               | Panasonic KXP 2624 Colour               | P.O.A. |
| LQ-1010                 | £279               | Panasonic KXP1654                       | £390   |
| LQ-1070                 | £329               | STAR                                    |        |
| LQ-1170                 | £439               | LC20                                    | £115   |
| LQ-1060 Colour          | £618               | LC200 Colour                            | £158   |
| LQ-2550 Colour          | £696               | LC15                                    | £180   |
| SQ-850                  | £439               | LC24-10                                 | £148   |
| SQ-2550                 | £635               | LC24-200                                | £184   |
| Hew/Pack Thinkjet*      | £270               | LC24-200 Colour                         | £222   |
| Hew/Pack Quietjet*      | £304               | LC24-15                                 | £299   |
| Hew/Pack Quietjet Plus* | £389               | ZA200 Colour*                           | £248   |
| Hew/Pack Deskjet 500    | £298               | ZA250 Colour*                           | £313   |
| Hew/Pack Paintiet*      | £450               | XB24-200 Colour*                        | £313   |
| Hew/Pack Paintjet XL*   | £1055              | XB24-250 Colour*                        | £375   |
|                         | s with * inc 1 yea | rs on-site maintenance.                 | 2010   |

DELIVERY Archimedes Micros only: Free Delivery Hardware: £7 + VAT per box Software: £7 + VAT per order

Lasers: £15 + WT per printer Next Working Day Service - call for details. UK Offshore - call for details

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Prices are subject to change without notice. Please check suitability with the manufacturers before ordering. Goods are not offered on a trial basis. Orders are accepted subject to our standard conditions of sale – available on request. E&OE.

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Send for fact sheets on technoSCAN, technoTablet, Multipod & Hard Disk Upgrades

# **TECHNOMATIC**

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## Archimedes computers

#### A3000

A3000 with 2Mb RAM (no monitor) £599
A3000 with 2Mb RAM Acorn Colour £798
A3000 with 2Mb RAM Cub 3000 Monitor £788

#### LEARNING CURVE PACKAGE

| A3000 LC with 2Mb (no monitor)  | £699  |
|---------------------------------|-------|
| A3000 LC with 2Mb & Cub 3000    | £888  |
| A420/1 LC with 4Mb (no monitor) | £1299 |
| A420/1 LC with 4Mb & Cub 3000   | £1488 |
| A420/1 LC with 4Mb & 770+LR     | £1666 |

#### **ARCHIMEDES A410/1**

| A410/1 (no monitor)      | £1099 |
|--------------------------|-------|
| A410/1 with Cub 3000     | £1288 |
| A410/1 with Taxan 770+LR | £1444 |
|                          |       |

# 410s enhanced to 2Mb + 20Mb drive ARCHIMEDES A440/1

| A440/1 (no monitor)          | £1699 |
|------------------------------|-------|
| A440/1 with Cub 3000         | £1888 |
| A440/1 with Taxan 770+LR     | £2044 |
| Free Pipedream 3 with A440/1 |       |

#### **New A540**

ARM3 + 100Mb SCSI fitted with 8Mb RAM (upgradeable to 16Mb)
A540 plus Taxan 795
£3285

Carriage £8/computer £12/system

#### technoTablet

Now 3 models to choose from, all providing a resolution of 1000 lines/inch with a serial connection to your Archimedes computer or upgrade required). (serial technoTABLETs offer an alternative, and more precise, way to control the mouse pointer. Each consists of a flat work area covering a bed of sensors. The standard mouse or tracker ball is unaffected and can even be used as alternatives for the same operation. The software to drive the tablet is supplied as a Risc OS application and provides many commands, such as enable or disable the tablet, switch between relative and absolute coordinates, alter puck movement sensitivity etc.

#### technoTablet 9

A new 9" by 6" tablet with captive 3 button stylus, perfect for sketching and for special needs applications.

#### technoTablet 12

The original 12" by 12" technoTablet with fourbutton puck. The puck cross-hairs allow accurate tracing of drawings.

#### technoTablet 18

A new, 18" by 12" tablet which will allow tracing of drawings up to A3 size. This technoTablet comes with a 3 button stylus as standard.

| technoTablet 9             | £109(b)          |
|----------------------------|------------------|
| technoTablet 12            | £179(a)          |
| technoTablet 18            | £329(a)          |
| Ontional Stylus for techno | Tablet 12 £15(c) |

# What we offer in addition to efficient sales service and professional backup!

We not only offer professional advice when you are purchasing your system but we will also provide friendly assistance afterwards. All our products carry a 12 month full warranty for parts and labour

# LEARNING CURVE PACKAGES

#### **ARCHIMEDES**

An Archimedes 420/1 with 2 MB RAM
20 MB Hard Disc and
First Word Plus wordprocessor
Genesis database
Acorn Desktop Publisher
PC Emulator and DOS software
Informative video and parental guide
to the National Curriculum

A420/1 LC with Cub 3000 (see price table on left)

#### A3000

with 1MB ACORN A3000
Tutorial Video
GENESIS Database
PC Emulator
FIRST WORD PLUS Wordprocessor
the parents guide to the national
curriculum

A3000 LC with Cub 3000 (see price table on left)

#### technoSCSI Packages for Archimedes

# SPEED QUALITY RELIABILITY COMPATIBILITY EXPANSION

We believe that the SCSI standard provides the best way ahead for Archimedes owners as is shown by Acorn's own adoption of it for the A540 and R260. SCSI allows the connection of up to 4 hard discs as well as the possibility of tape streamers, page scanners, CD ROMs as well as other Archimedes computers.

- ★ SCSI II command set compatibility
- ★ Acorn compatible software interface
- ★ Single width 16 bit podule for 300/400 series
- ★ Internal 8 bit with User Port for A3000
- ★ Zero wait state 16 bit MEMC controller
- ★ Fast data transfer with software caching
- ★ Continuous transfer rates up to 1.5 MB/S
- ★ OS selectable background transfer and command queueing
- \* Full support for SCSI by RISC OS
- ★ Full support by major software houses

- ★ 7 SCSI devices per technoSCSI card
- ★ Multiple technoSCSI cards allowable
- ★ One technoSCSI card supports up to 4 hard discs per computer
- ★ SCSI hard discs from 40 to 500Mb can be used together
- ★ Complete TESTED packages ready to install
- ★ Optional external termination
- ★ Internal and external sockets on 300/400 series
- ★ Professional packaging for external drives
- ★ Fully screened cable for external drives

# technoSCSI Packages for 300/400 series

A single width podule with a choice of internal or external drives. Internal are complete with all fittings and cables. External drives feature compact, professional cases with switched drive select and screened cables.

| technoSCSI card only  | £179(b) |
|-----------------------|---------|
| 47Mb internal + card  | £329(a) |
| 105Mb internal + card | £529(a) |
| External terminator   | £12(d)  |
| 47Mb external + card  | £379(a) |
| 105Mb external + card | £579(a) |

#### technoSCSI Packages for A3000

An 8 bit internal technoSCSI card with User Port avoids using up that precious external expansion. External drives are housed in compact, professional cases with switched drive select and screened cables.

technoSCSI card (A3000) £179(b)

47Mb external + card £379(a)

105Mb external + card £579(a)

External terminator £12(d)

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£49(b)

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(d) £2.00
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## techno-I

The techno-I Real-Time Colour Video Digitiser for Archimedes computers is one of the most advanced video digitisers available, with features usually found only on top-of-the-range models for the IBM PC.

The techno-I card, with RISC OS multitasking software, allows you to grab a picture from a video source (TV, Video recorder, etc.) and convert it into a sprite. This can then be dragged to RISC OS applications such as art or DTP packages.

Unlike simple RGB video digitisers, technol handles colour in 25 bits with 7 bits luminance and 18 bits chrominance. By manipulating the image using hue, saturation and luminance, it mimics the human visual system. The colours are therefore truly WYSIWYG. techno-I will also give true monochrome representation of colour images.

The on-screen viewfinder displays live colour or monochrome in real-time. The viewfinder can be either 1/16 or 1/4 screen area, and can be offset vertically and horizontally under user control.

The frame buffer resolution is up to 512 by 512, with programmable vertical and horizontal resolution. Complex frame manipulation features are built into the hardware including options to grab the current frame or previous frame and grab the last completed frame.

All viewing, video and digitising parameters are software controlled, there are no presets, no setting up, simply connect to a video signal, load the software and digitise!

#### techno-I features include:

- ★ 25 bits resolution, 7 bits luminance and 18 bits chrominance
- ★ Contrast, colour and brightness set from Desktop
- ★ Image scaling up to 1280 by 1024 in any 256 colour mode
- ★ Selectable or automatic monochrome/colour digitising
- ★ Auto detection of video signal, field frequency and colour
- ★ Single width podule using surface mount technology
- ★ Zero wait state 16 bit MEMC podule
- ★ Low chip count (13 chips) utilising the latest technology
- ★ 40% of chips Brainsoftware custom designed
- ★ Uses a single 5v supply, no extra 12v supply required
- ★ Compatible with international TV standards
- ★ Chrominance comb filter for studio quality CVBS colour
- ★ Colour Transient Improver sharpens edges of coloured objects
- ★ Picture signal improver enhances the luminance content
- ★ Automatic black level and gain control
- \* Hardware programmable noise filtering
- ★ Supplied with latest ChangeFSI release
- ★ SVHS input upgrade available

techno-I for 300/400, 540, etc techno-I for A3000 £279(b) (Securely boxed for external fitting)

SVHS Upgrade £100(d)

#### techno-ION Bundle

A unique package comprising techno-I, the SVHS upgrade and the Canon ION camera techno-ION for 300/4000 Series £699(a) techno-ION for A3000 £729(a)

Send for full details and free demo discs. Existing users can upgrade to techno-ION

# techno5CADII

# Probably the definitive monochrome scanning package!

The all NEW technoSCAN II package provides full monochrome operation at 400 dpi as well as 8 and 16 level grey scale scanning and provides the following features:

Suitable for all Archimedes micros and integrates fully with the multitasking RISC OS environment.

Advanced memory management system releases memory when not required allowing scanning and DTP in a 1MB computer.

Flexible zoom control allows palettes to be imported, tailored and resaved with more powerful tone and tinting features than most painting packages.

Interactive help and a superb manual.

Direct printing with RISC OS drivers.
Saves sprites direct into PAINT and DTP or to disc.
Saves sections and palettes into any graphics

At the same low price as the well tested original.

technoSCAN II complete with interface card and manual technoSCAN II for A3000 £175(b) technoSCAN II upgrade

for techno SCAN £22.50(c)

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with stereo sound £209(a)

Taxan 770+LR 14" Multisync

Hi Res monitor £365(a)

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includes 1 year on site maintenance limited period offer

Paintjet Printer driver £15(d)
Parallel Printer Lead £7(d)

#### ARCHIMEDES MODEM PACK

Miracom WS4000 lead and ARC
Comm Software Modem Pack
£129(b)

#### **A300 & A400 SERIES**

|                                | HOUS WHI | OU CEITIE                 | Service Control of the Party of the Control of the |
|--------------------------------|----------|---------------------------|---|
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| MIDI Add-on to I/O card        | £37(c)   | AD C1208 A to D Convertor | £495(b)   |
| MIDI Expansion Card            | £66(c)   | Dual RS232 Serial card    | £195(b)   |
| Wild Vision Chroma Genlock CG2 | £215(b)  | IEEE Interface            | £283(b)   |
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| A420/1 2Mb | £79(c)  |
| A410/1 3Mb | £129(c) |
| A440 4Mb   | £649(*) |

ARM 3 FITTED BY US £375(\*)

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Wild Vision Chroma Genlock CG1
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£49(b)
£215(b)
£19(c)
£17(b)

#### A3000 Technical Manual £29(c)

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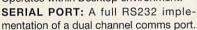
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#### A3000 MULTIPOD PROFESSIONAL

Professional design and use of latest hardware/software technology have enabled this five function podule to provide the highest quality performance at an economical and realistic price. The five functions are:

FAST-SCAN VIDEO DIGITISER: Offers the highest resolution and number of picture levels of any video digitiser for the Archimedes computers. Capable of digitising in any mode to 640 x 512 pixels with 256 grey levels. Colour can be digitised with a camera and filters providing 24 bit colour resolution. Software operates within Desktop and offers contrast/brightness control, zooming, grey scaling and sprite

SOUND DIGITISER: Samples for sound frequencies from 4KHz to 80Khz can be manipulated, composed and saved. Editing functions include filtering, mixing, overlaying, swapping, cut/paste. Saved sound modules including stereo sound samples can be used in various applications including games or can be exported to other sound packages. Operates within Desktop environment.



It is IBM compatible using a 25-way D connector. Uses FX and SYS calls. INSTRUMENTATION/JOYSTICK PORT: A high speed A to D convertor which provides samples at up to 100 KHz for versatile datalogging. As BBC B analogue port, uses the usual ADVAL commands.

| Multipod Professional A3000  | £130(b) |
|------------------------------|---------|
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#### **MULTIPOD BREAKOUT BOX**

The Multipod Breakout Box splits up the RGB components of a colour video source and links them into the Multipod's slow scan digitising input. Controlled switching of the Breakout Box is provided from the Multipod using a new RISC OS colour video module.

You can now digitise full colour images direct from your home VCR, (must have perfect freeze frame), or rostrum camera using your Multipod. £85(b) **Multipod Breakout Box** 

#### SPECIAL SUMMER OFFER Multipod +Breakout Box for A3000 £205(b)

£379(a)

# rchimedes SOFTWARE

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|---------------|--------|
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| Jiglet        | £27(d) |
| Snippet       | £27(d) |
| Desktop Folio | £85(c) |
| Poster        | £79c)  |

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|---------------|--------|
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| Atelier       | £65(c) |
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| Presenter II  | £35(c) |
| Graph Box     | £55(c) |
| Gamma Plot    | £35(c) |
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| Revelation    | £69(c) |
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compatible. PD800/PD352/PD853 are Archimedes

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in a 5.25" case.

PS351 3.5 single drive with integral mains power supply in a 5.25" case. TD352 Dual 800K/1280K PS352 3.5" dual drive with

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£95(b) £126(a) integral mains power supply

#### techno CAD for Master 128

technoCAD will meet the needs of most professional applications and it is an ideal tool for teaching CAD in technical schools, CDT £50(c) departments and collages.

NOVACAD Computer Aided Draughting System for BBC

Novacad can drive a plotter to produce drawings of highest quality ... Novacad is excellent. It is flexible, genuinely easy to operate without much practice, ... and a pleasure to use. Deebug Dec86

NOVACAD T/m version £39(d) NOVACAD T/m Plotter DG £49(c) £12(d) Plotter Driver Generator

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- ★ Highly sophisticated & Advanced Programmer
- \* All current single rail eproms handled
- ★ State of the Art Programming Algorithms The single rail eproms handled by the EpromRyter are:
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for Master & BBC





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#### CC COMPUTER SERVICES

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| 410/1 4Mb, 40Mb H  | ard D  |                        | £1455       |  | U DISCS  |
| 420/1 Base   |        | £1090                  | £1290       | £688 + VAT   |          |
| 420/1 Learning Cu  | rve    | £1125                  | £1320       | E STATE OF THE STA |          |
| 440/1 Base   |        | £1449                  | £1644       | Add £195+VAT to above for  | r System |
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| BBC BASIC Guide  | £19 I  | lease add VAT at       | 17.5%       | Twin World   | £1       |
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| Assembly Language  | £14    | Software               | FREE        | STAR LC-10   | £15      |
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Whatever your computing needs, phone us on 0279 718767, or fax 0279 718596



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# Watford Electronics

(A member of the Jessa group of Companies - Established 1972)



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| System | Basic | Mono  | Colour | Multiscan |
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| 440/1  | £1699 | £1759 | £1869  | £2048     |
| 540/1  | £2995 | £3065 | £3169  |           |

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|---|------|
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|--|----------------|------|
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| <ul> <li>A3000 User/Analogue/II</li> </ul> | C I/O Card     | €42  |
| A3000 External Podule                      |                | £13  |
|  |                |      |

#### Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

| Micro  | Free Offer  |
|--------|---|
| A410/1 | Upgraded to 2MB RAM & 44MB IDE<br>Hard Drive  |
| A420/1 | Upgraded to 4MB RAM & 100MB IDE<br>Hard Drive, MkII Learning Curve pack<br>incl. Acorn DTP pack |
| A440/1 | High Res 14" Multiscan Colour Monitor   |
| 540/1  | High Res Multiscan Monitor & Panasonic KX-P1180 Printer   |
| A3000  | Upgraded to 2 Megabyte of RAM & a A3000 Monitor plinth.   |

#### + 12 months FREE On-Site Maintenance

(P.S. Instead of the above Hardware upgrades on A410/1 & A420/1, we will fit the 30MHz Turbo Board if required. Please specify your requirement when ordering.)

#### **Archi Accessories**

| Aloni Addessories   |      |
|---|------|
| NEW Multitasking RISC OS                                      | £29  |
| • 3.5" 800K 2nd Floppy Drive (305/310)                        | £118 |
| • 5.25" 800K external Floppy Drive                            | £85  |
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| I/O Podule (Analogue/User/IIC Ports)                          | £42  |
| MEMC 1A Upgrade   | £42  |
| MIDI add-on to I/O Podule                                     | £27  |
| MIDI Expansion Card   | £65  |
| Sound Sampler Mono (Armadillo)                                | £129 |
| Sound Sampler Stereo /Midi (Armadillo)                        | £186 |
| Chromalock Podule (Wild Vision)                               | £275 |
| Econet Network Board  | £42  |
| Archimedes IEEE Interface Adaptor                             | £269 |
| Dual RS232 Podule   | £195 |
| 16 bit parallel I/O Card                                      | £195 |
| Archi replacement mouse - New design                          | £32  |
| PC Emulator NEW Faster Version                                | £85  |
| Software Developers Toolbox                                   | £149 |
| Floating Point Unit   | £455 |
| SCSI Adaptor Expansion Card                                   | £162 |
| Keyboard Extension Lead                                       | 26   |
| 2 Podule Backplane  | £25  |
| 4 Podule Backplane  | £38  |
| Fan for above backplanes                                      | £8   |
| Risc Os Extras Software Disc                                  | £    |
| <ul> <li>Smoked Perspex Low profile Keyboard Cover</li> </ul> | 28   |
| Ethernet Card   | £220 |
|   |      |

#### ARM 3 Turbo Card



Here it is at last — the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £199. Mk II upgrade will increase the speed of your micro

by a factor of 3 to 6. Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £35.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

Launch Offer: Only £199

#### **Archimedes RAM Upgrade**

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

| • R302-A3000 - to 2MB RAM Upgrade                    | £39  |
|--|------|
| R303-A3000 - to 2MB RAM Upgrade                      |      |
| (expandable to 4MB)                                  | €69  |
| • R304-A3000 - to 4MB RAM Upgrade                    | £159 |
| R311-A305 - to 1MB RAM Upgrade                       | £50  |
| • R312-A305/310 - to 2MB RAM Upgrade                 | £215 |
| • R314-A305/310 - to 4MB RAM Upgrade                 | £405 |
| • R412-A410/1 - to 2MB RAM Upgrade                   | £35  |
| <ul> <li>R413-A420/1 — to 4MB RAM Upgrade</li> </ul> | €64  |
| • R414-A410/1 - to 4MB RAM Upgrade                   | 298  |
| • R810-A410/1 - to 8MB RAM Upgrade                   | €599 |
| • R820-A420/1 - to 8MB RAM Upgrade                   | £569 |
| • R840-A440/1 - to 8MB RAM Upgrade                   | £499 |
| R814-R140 - to 8MB RAM Upgrade                       | €499 |
|  |      |

#### **Archimedes Hard Disc**

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided. The 'simple to follow' fitting instructions supplied makes drive fitting very easy. All disc drives are auto parking, 40Meg & 53Meg drives are fast 24mS type, while 20MHz are 28mS.

P.S. A310 upgrades require a backplane and a fan.

| 3HDP - Hard Disc Podule only             | £13 |
|--|-----|
| • 3HD20 - 20Meg H' Disc + Podule for 310 | £23 |
| • 3HD40 - 40Meg H' Disc + Podule for 310 | £34 |
| • 3HD50 - 53Meg H' Disc + Podule for 310 | €47 |
| • 4HD20 - 20Meg Hard Disc for 410        | £12 |
| • 4HD40 - 40Meg Hard Disc for 410        | £21 |
| • 4HD50 - 53Meg Hard Disc for 410        | £33 |
| A3000 20Meg Hard Disc + Podule           | £29 |
| A3000 40Meg Hard Disc + Podule           | £42 |
| For IDE Hard Disc turn to page 14        |     |
|  |     |

# Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

|        | _      |                      |      |
|--------|--------|----------------------|------|
| UP10 - | to 2MB | RAM + 20MB Hard Disc | £165 |
| UP15 - | to 2MB | RAM + 40MB Hard Disc | £252 |
| UP20 - | to 4MB | RAM + 20MB Hard Disc | £232 |
| UP30 - | to 4MB | RAM + 40MB Hard Disc | £318 |
|        |        | RAM + 53MB Hard Disc | £438 |
|        |        |                      |      |

#### **Archi Mouse Port Splitter**

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes.

#### Graphics, Art, Design & Games

Nevryon

GRAPHICS

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| Atener             | 205 | Distributes          | 017                 |
|--------------------|-----|----------------------|---------------------|
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| Artisan Gallery    | £16 | Pirate               | £16                 |
| Autosketch II      | £65 | Power Band           | £18                 |
| Craftshop 1 & 2    | £28 | Puncman 1 & 2        | £16                 |
| Euclid 2           | £50 | Puncman 3 & 4        | £16                 |
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| HotLink Presenter  | £40 | Quazer               | £10                 |
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| Mogul              | £17 | Real McCoy 2         | £23                 |
| Poster             | £79 | Redshift             | £14                 |
|                    | £70 |                      | 216                 |
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| Render Bender      | £58 | Revelation           | £54                 |
| Snippet            | £21 | Repton 3             | £15                 |
| Tween              | £21 | Rotor                | £19                 |
|                    |     | Saloon Cars          | £19                 |
| GAMES              |     | Splice               | £25                 |
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| Ballerina          | £14 | Trivial Pursuit      | £22                 |
|                    | £16 | Twin World           | £15                 |
| Blowpipe           |     | TWIII WORLD          | £23                 |
| Boogle Buggy       | £19 | U.I.M.               |                     |
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| Enthar Seven       | £21 | Broadcaster Loader   |                     |
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| E-Type Designer    | £13 | FlexiFile            | £98                 |
|                    | LIS | Genesis              | £65                 |
| E-Type Extra 100   | 040 |                      | COCHARDON PROPERTY. |
| miles              | £13 | Genesis 2            | £113                |
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| Fireball 2         | £19 | Pack                 | £50                 |
| Gumshoes           | £19 | Investigator 2       | £22                 |
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| Jigsaw             | £27 | Speechl              | £15                 |
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#### Staff Vacancy

Watford Electronics are inviting Hardware and Software engineers to apply for positions in their new R & D team. Hardware engineers must be familiar with the Archimedes architecture and able to follow a project from conception to production. Software engineers should be proficient in ARM assembler or Acorn C, and able to write RISC OS applications and module code. Applicants should be well motivated and show experience in relevant areas. Qualifications are not as essential as your ability to produce innovative solutions to challenging problems. As a new member of the team you will be in a unique position to develop your career in a rewarding environment

In the first instance forward your CV to Shiraz Jessa or Chris Honey.

#### **Desk Top Publisher**

| Acorn's Archi DTP Package | £108 |
|---------------------------|------|
| Impression 2 DTP Pack     | £130 |
| Impression Junior         | £72  |
| Tempest DTP Package       | £90  |

#### Archimedes New Launch See Pages 2, 3 & 14

#### **Archi Wordprocessors**

| Pendown Archi     | £48 | Archie Spell Master £25 |     |
|-------------------|-----|-------------------------|-----|
| Wordwise + Disc   | £24 | PD Spellchecker         | £40 |
| Image Writer      | £25 | View                    | €45 |
| Interword Disc    | £24 | Graphic Writer          | £19 |
| 1st Word Plus - 2 | £63 | EasyWord                | £30 |

#### **Databases**

| AlphaBase      | £36      | Multistore | £195 |
|----------------|----------|------------|------|
| Knowledge Orga | niser£42 |            |      |

#### **Spreadsheets**

| Intersheet Disc | £24 | Viewsheet | £45 |
|-----------------|-----|-----------|-----|
| Sigmasheet      | £39 | Schema    | 289 |

#### **Business Graphics**

| GammaPlot       | £39 | Sigmaplot | £39 |
|-----------------|-----|-----------|-----|
| Interchart Disc | £17 |           |     |

#### Integrated Packages

| <ul> <li>Logistix</li> </ul> | £79 | Pipedream 3 | £119 |
|------------------------------|-----|-------------|------|
|                              |     |             |      |

- Desktop Office Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications
- Desktop Folio Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment.

#### A3000 I/O Card (User, Analogue & IIC)

£98

£85

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
   A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- I/O podule.

   An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

Can you afford to miss the Array of New products for the Archimedes Micro from Watford Electronics making their first public appearance at the BBC Acorn User Show? Our technical team will be pleased to demonstrate any of these products.

- A3000 ARM 3 Turbo Upgrade
- User port/Analogue & Ilc Card
- A4 B&W Flatbed Hand Scanner
- Archi Colour Flatbed Scanner
- Archi Colour Hand Scanner
- Advanced Graphics Card
- VIDC Enhancer Boards
- IDE Hard Disc Controller Card
- IDE Plug-In Hard Card
- Infra Red Remote Control Mouse
- Aries AlphaScan Multisync Monitor

#### **Silicon Vision**

| Gerber Plot     | £95      | Solids Render | £120 |
|-----------------|----------|---------------|------|
| Solid CAD       | £120     | Solid Tools   | £279 |
| Super Plot      | £28      | Data Vision   | £110 |
| Super Dump      | £22      | Share Holder  | £135 |
| Arc PCB Profes  | sional   |               | £275 |
| Realtime Solids | Modeller |               | £136 |

#### Archimedes A300/A400 NEW SCSI Hard Disc Offer (while stocks last)

100MB Hard Disc Upgrade complete with Controller card. Cables, Formatter and Manuals

RRP: £999

Offer Price: £399

#### Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers. New RISC OS Version Only £15

#### **Archimedes External Disc Drive Interface**

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

A300/A3000 £21 • A400

#### Special Education Prices

All education establishments qualify for special education prices on micros, etc. Please write in or telephone (0923) 37774 or 50335 for written quotation.

#### LANGUAGES (Archimedes)

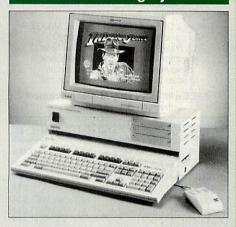
| ISO-PASCAL; FOR  | RTRAN  | 177 £7         | 7 each |
|------------------|--------|----------------|--------|
| Assembler; LISP; | Prolog | X £14          | 9 each |
| ANSI C Rel. 3    | £125   | BASIC Compiler | £77    |
| Cambridge Pascal | £60    | Logotron Logo  | £45    |
| Macro Assembler  | £40    | Risc Basic     | £120   |
| Robo Logo        | €69    | Risc FORTH     | £110   |

#### Minerva's Archimedes Software

| Home Accounts*              | £36     | Sales Ledger*   | £53  |
|-----------------------------|---------|---|------|
| Stock Manager*              | £53     | Purchase  |      |
| Nominal Ledger*             | £53     | Ledger*   | £53  |
| Ancestry                    | £59     | Reporter  | £29  |
| System Delta+               | £55     | Mailshot*   | £29  |
| System Delta + Re           | eferenc | e Manual  | £25  |
| Order Processing/Invoicing* |         |   | £53  |
| School Administra           | tor     | No. of Concession, Name of Street, or other Party of Street, or other | £118 |
|                             |         |   |      |

\* Requires System Delta
NEW Business Accounts Packages
Nominal Ledger, Order Processing/Invoicing,
Purchase Ledger, Sales Ledger & Stock Control Price: £78 per Module or £299 for the complete Software Suite

#### **ULTIMUM – Archimedes A3000 Podule Racking System**



#### THE ONLY LOGICAL WAY TO **EXPAND YOUR A3000 COMPUTER**

The accepted standard for Archimedes computer expansion is the Acorn Podule, designed initially to fit the old 310, and also for the later A400 and A400/1 series micros. The podules fit inside these computers up to four at a time. The A3000 is the little brother of the family, but can only have one podule at a time, plugging into the back of the computer.

Other attempts have been made to expand the A3000 by trying to introduce a 'mini-podule'. This is impractical for many reasons, amongst which is the reluctance of manufacturers to produce them. Nobody wants to re-design podules already produced. Some cannot be produced on a 'minipodule' as they are far too complicated and simply

Watford Electronics listens to the demands and requirements of its customers, and we are glad to say that we have come up with the only real solution to the A3000 expansion problem. The ULTIMUM Podule Racking System allows up to three FULL SIZE standard Archimedes 300/400 series podules to be fitted to the computer. In addition, there is also provision for a hard disc drive and a podule to be fitted internally.

Since the ULTIMUM Podule Racking System takes proper full size podules, you will be able to use any of the currently available peripheral equipment, from companies like Computer Concepts, Armadillo, Acorn and of course, our own brand.

Fitting the podules to 'ULTIMUM' is simple. They are neatly fitted inside the metal case of the rack, avoiding the previously untidy method of hanging the podule off the back of the computer, risking

damage to both, it and to the computer.
'ULTIMUM' has its own power supply, so no strain is put on the A3000 power supply. There is also an IEC mains output socket for an Acorn type monitor so reducing the number of plugs required to go to the mains. The ULTIMUM is rigidly clamped over the top and under the computer, and allows direct access to the floppy disc drive and reset button, rather than obstructing access as on other systems. The mounting method employed is so firm that the computer could even be safely transported without the assembly falling apart.

Price: £125

#### BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER £399 (see below)

#### FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during October

#### **ADD-ONs & ACCESSORIES**

| Turbo 65C102 Add-on Module         | £115         |
|------------------------------------|--------------|
| Econet Module for the Master       | £45          |
| Twin ROM Cartridge for Master      | 29           |
| Quad ROM Cartridge for Master      | £14          |
| Master Reference Manual I          | (No VAT) £14 |
| Master Reference Manual II         | (No VAT) £14 |
| Master Advance Ref Manual          | (No VAT) £17 |
| 64K Upgrade Kit for B+             | £32          |
| Acorn 1772 DFS Kit complete        | £49          |
| ECONET Upgrade Kit for BBC B       | £42          |
| ALL ECONET UPGRADES Availal        | ble          |
| ARIES' IEEE Interface for BBC B 8  | Master £238  |
| Morley Teletext Adaptor with ATS I | Rom £99      |
| Ecolink                            | £270         |

#### **Z88 Portable Micro**



£185

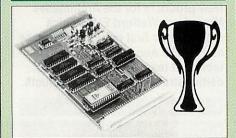
#### FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

#### **Z88 ACCESSORIES**

| 32K RAM Pack or 32K EPROM Pack     | £18.00 |
|------------------------------------|--------|
| • 128K RAM Pack or 128K EPROM Pack | €42    |
| 512K RAM Pack                      | £175   |
| Z88 Eprom Eraser Unit              | £33    |
| Z88 Spellmaster for Pipedream      | £40    |
| Z88 Carrying Case                  | 83     |
| Z88 Computing Book                 | £9.95  |
| AA Nicad Rechargeable Battery      | £1.50  |
| Battery Charger Compact & Fast     | 26     |
| Z88 Serial Printer Cable           | £8     |
| Z88 Parallel Printer Cable         | £25    |
| Z88 to Archi Link                  | £15    |
| ● Z88 to BBC Link £20 ● Z BASE     | £5€    |
| ● Z88 to PC Link II £30 ● Z TAPE   | £42    |
| ■ Z88 to Macintosh £52 ■ Z TERM    | £42    |
| ● Z88 Mains Adaptor £9 ● Z88 Modem | £149   |
|                                    |        |

#### Archi Real-Time Digitiser



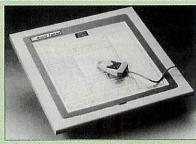
#### Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

#### Price £175

A Set of Colour Filters for colour image grabbing using a video camera New Risc-OS Software Upgrade £39

#### Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear

Graphic for use in Education). (FREE this month, PC Mouse Drivers & Art package)

#### Special Price £199

(Price includes Tablet, Leads, Software & Puck) Stylus Optional Extra £15

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £125

#### **Disc Plonker** Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data



from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: £2

#### Acorn & Watford DFSs

| Watford sophisticated DFS ROM                              | £16.00 |
|--|--------|
| Watford DFS Kit complete                                   | £69.00 |
| <ul> <li>We will exchange your existing ROM for</li> </ul> | or     |
| Watford's ultimate DFS ROM at only                         | £12.00 |
| DFS Manual (comprehensive)                                 | €6.95  |
| Acorn DNFS ROM   | £17.00 |
| Acorn ADFS ROM only  | £25.00 |
| Acorn 1772 DFS ROM Kit                                     | £49.00 |

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

#### Watford's Mkll 1772

#### Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible Use ADFS on our DDFS board.
- Tube host Code No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing no need to fuss with 40/80 track switches (even works with protected
- An extremely powerful 8271 emulation ensuring compatibility with almost all software. New low profile – small footprint board. Fits with all third party ROM boards.
- Option to double the speed of file handling operations - BPUT and BGET.
- Operates in both single and double density
- OSGBPB has been recoded, increasing still further the speed of file handling

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk - Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only £39.00.

SPECIAL PRICE

 DDFS Manual (No VAT) £6.95

 We will exchange your existing DFS Kit for our sophisticated DDFS for only

230. £30.00

Please note, as the MkII DDFS is a hardware and sofware upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version



#### 3M - Diskettes

3M - SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed

| • 10 x 5.25" S/S D/D 40T (744)             | £5    |
|--|-------|
| • 10 x 5.25" D/S D/D 40T (745)             | £5    |
| • 10 x 5.25" S/S D/D 80 Track (746)        | £7    |
| • 10 x 5.25" D/S D/D 80 Track (747)        | £7    |
| • 10 x 5.25" 1.6M D/S D/D High Density for | r IBM |
| XT and AT                                  | £9    |
| ● 10 x 3.5" S/S D/D 40/80 Track            | £7    |
| • 10 x 3.5" D/S D/D 40/80 Track            | £7    |
| • 10 x 3.5" Double Sided High Density      | £13   |
|  |       |



## Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

| £7         |
|------------|
| £12        |
| £5         |
| £5         |
| £7         |
| £9         |
| £2.50 each |
|            |



**CREDIT CARD 24 HOUR Ansaphone Hot Lines** (0923) 50234 or 33383

#### **Quality Disc Drives from** Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable.

For ease of use, the switches are front mounted. Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a

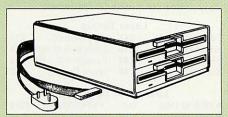
Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. Ideal for Schools & Colleges.

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the

6th page of our advert for the Plinths). P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

#### "Test Bureau Approved for Use in Education"





#### Our Disc Drives conform to BS415

| type                 | Description                                     |             |
|----------------------|---|-------------|
|                      | <b>Disc Drive without</b>                       | PSU         |
| •CLS400S:            | Single, 40/80 track 400K<br>Double sided Drive  | £72         |
| •CLD800S:            | Twin, 40/80 track, 800K<br>Double sided Drives  | £142        |
|                      | Disc Drive with PS                              | U           |
|                      |   |             |
| •CS400S:             | Single, 40/80 track, 400K<br>Double sided Drive | £82         |
| •CS400S:<br>•CD800S: |   | £82<br>£155 |

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

#### Disc Drive/DDFS Offer



- The popular CLS400S 40/80 track switchable disc drive
- Watford's popular Mk II DDFS Interface (allows) up to 720K storage). Will run both in single & double density modes
- A comprehensive DFS Operating manual

Bargain at Only £116 (Offer valid until stocks last)

#### 3.5" DISC DRIVE



These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

| Туре       | Description                                 |      |
|------------|---|------|
|            | Disc Drive without PSU                      |      |
| • CLS35:   | Single Disc Drive, 400K                     | £62  |
| • CLD400S: | Twin Disc Drives, 800K  Disc Drive with PSU | £109 |
| • CS35:    | Single Disc Drive, 400K                     | £83  |
| • CD35:    | Twin Disc Drives, 800K                      | £126 |

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

#### Disc Drive Sharer



#### (Ideal for educational establishments)

A low cost alternative to the Econet system.Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC Micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with

Price includes 3 Cables

## **Disc Drives in Monitor Stand**



• CDPM 800S - Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

• DP35 800 - Same as above except, one disc drive is a 5.25" and the other is 3.5".

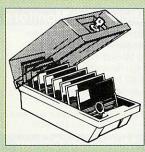
£154

#### Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

#### **Antistatic Lockable Disc Storage Units**



Gives double protection – Strong plastic case that affords real protection to your discs.

Antistatic helps avoid data corruption whilst in

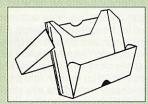
storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

| <ul> <li>M35 – holds up to 50 5.25" discs</li> </ul> | £4.95 |
|--|-------|
| <ul> <li>M85 – holds up to 95 5.25" discs</li> </ul> | £6.95 |
| <ul> <li>M25* – holds up to 25 3.5" discs</li> </ul> | £4.95 |
| <ul> <li>M50 – holds 50 3.5" discs</li> </ul>        | £6.50 |

• M10 - holds 8 of No. 10 Data Cartridges £15 Not lockable

#### **Plastic Library Cases**



Holds up to 10 x 3.5" Discs. Holds up to 10 x 5.25" Discs. £1.50 £2.00

#### **Dust Covers** (For our Disc Drives)

| Single CLS (without PSU) | £3.20 |
|--------------------------|-------|
| Single CS (with PSU)     | £3.25 |
| Twin CLD (without PSU)   | £3.85 |
| Twin CD (with PSU)       | £3.90 |

#### **Disc Albums**

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

#### Special Bulk Offer on Discs

(Supplied packed in Anti-Static Lockable Storage Units) (Lifetime warranty on Discs)





#### **BULK PACK DISCS in lots of 100**

|   |                       | S/S    | D/S   | D/S    |
|---|-----------------------|--------|-------|--------|
|   | Type                  | 40T    | 40T   | 80T    |
| • | Without Sleeves 5.25" | £30    | £35   | £40    |
| • | With Sleeves 5.25"    | £33    | £38   | £43    |
| • | 3.5" D/S D/D £29      | for 50 | £52 f | or 100 |



#### **Microvitec Monitors**

| • 1431 - Standard Resolution Monitor                       | £169   |
|--|--------|
| • 1451 - Medium Resolution Monitor                         | £209   |
| Cub3000 Medium Res for A3000                               | £189   |
| • 1441 - High Resolution Monitor                           | £359   |
| • 2040 CS 20" Hi Res                                       | £675   |
| Dust Cover for Microvitecs                                 | £5.50  |
| Touchtec 501 Touch Screen                                  | £239   |
| Now 3 years Parts & Labour warranty<br>Microvitec Monitors | on all |

#### **Multiscan Colour**

| • Eizo 9060S                     | £389     | NEC 5D      | £117   |
|----------------------------------|----------|-------------|--|
| • Eizo 9070S                     | £579     | Taxan 770LR | £37  |
| NEC 2A                           | £245     | • Taxan 775 | £36  |
| NEC 3D                           | £323     | Taxan 795   | £40  |
| NEC 4D                           | £629     | Taxan 875   | 266  |
| <ul> <li>VIDC Enhance</li> </ul> | er Board |             | £2   |
|                                  |          |             | Section of the last of the las |

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)



#### Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

£325

#### **Philips Monitors**

| BM7502 12" Hi-res Green Monitor    | £67  |
|------------------------------------|------|
| BM7522 12" Hi-res Amber Monitor    | £67  |
| CM8833 14" Med. Res Colour Monitor | £170 |
| TV Tuner for CM8833 Monitors       | £62  |
| Dust Cover for Philips Monitors    | 26   |
| EDEE Out - I De III DE III - OMO   | 0001 |

FREE Swivel Base with Philips CM8833!

#### STAR BUY

PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

**ONLY £167** 

#### **Refurbished Monitors**

| Philips 14" Refurbished Colour Monitors, |      |
|--|------|
| same specification as the 'Star Buy'     |      |
| Monitors above                           | £119 |
| (Offer valid while stacks last)          |      |

#### **Spare Monitor Leads**

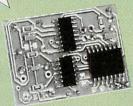
| BNC Lead for Zenith or Philips | £3    |
|--------------------------------|-------|
| Skart Monitor Lead             | £5    |
| RGB lead for TAXAN Monitors    | £3    |
| Archimedes Colour Monitor Lead | £7.50 |

#### **Anti Glare VDU Screen**

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

£12





This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: This provides support for both VGA and Multisync monitors. A unique electronic design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control

under software control £4

MultiVideo VIDC Card: As above but for MultiScan monitors only.

#### Panasonic Printers



| • KX-P1081  | £105 | • KX-P1180 | £99  |
|-------------|------|------------|------|
| • KX-P1123  | £144 | • KX-P1624 | £285 |
| • KX-P1124i | £194 | • KX-P1654 | £399 |
| • KX-P1170  | £125 | • KX-P1695 | £285 |

#### **Panasonic Accessories**

#### **Cut Sheet Feeders**

| KX-P1592/1595 (P32) | £175 | KX-P1540 (P35) | £175 |
|---------------------|------|----------------|------|
| KX-1124 (P36)       | £79  | KX-P1180 (P37) | £66  |
| KX-P1624/1695 (P38) | £124 | KX-P1123 (P37) | £66  |

#### **Buffers**

| P12 | 4K buffer Board for 1081       | £55 |
|-----|--------------------------------|-----|
| P42 | 32K buffer Chip for 1592/1595  | £16 |
| P43 | 32K Buffer Chip for 1123/24/80 | £16 |

#### Serial Interfaces

P17 P1081/1592 £32 P19 P1124/1180 £49

#### **Citizen Printers**

120D Plus

£96 124D Printer

£139

| Prodot 9      | £196      | Prodot 24 | £219       |
|---------------|-----------|-----------|------------|
| Prodot 9X     | £245      | Swift 24  | £205       |
| Swift 9       | £129      | Swift 24X | £264       |
| Prodot Cut S  | heet Feed | er        | £120       |
| Swift 24 Cold | ur Option |           | £29        |
| Swift 24 Ribb |           | ck £4     | Colour £13 |
| Swift 24X Cu  |           |           | £125       |
| Prodot 24 Cu  |           |           | £124       |

#### **Integrex Colour Jet**

| Colour Jet 132 Printer       | £499   |
|------------------------------|--------|
| Paper Roll                   | £6.50  |
| BBC Screen Dump Software     | £10    |
| Colour Cartridge             | £21    |
| Black Cartridge              | £12.40 |
| 100 A4 OHP transparencies    | £55    |
| 8K Serial Interface Optional | £123   |

#### **Star Printers**

| • LC10 9pin 80col. 144/36 CPS             | £105 |
|---|------|
| LC15 9pin 136col. 180/45 CPS              | £173 |
| • LC24-10 24pin 80col. 180/60 CPS         | £143 |
| • LC24-15 24pin 136col. 200/67 CPS        | £288 |
| • FR10 9pin 300/76 CPS 31K 16 fonts       | £210 |
| FR15 Wide carriage version of above       | £260 |
| • XB24-10 24pin 80col. 240/80 CPS         | £269 |
| • XB24-15 24pin 80col. 240/80 CPS         | £345 |
| • XB24-200 Colour 24pin 136col 300/100cps | £309 |
| • XB24-250 Colour 24pin 136col 300/100cps | £379 |
| XB-24 Colour Kit                          | £29  |
| • LC-200 Colour 9pin 80col. 180/45 CPS    | £152 |
| • LC-24-200 24pin 80col. 222/67 CPS       | £180 |
| • LC24-200 Colour 24pin 80col. 222/67 CPS | £217 |
| SJ-48 StarJet 360dpi                      | £209 |
| • ZA-200 Colour 9pin 80/136col 420/84cps  | £319 |

#### Star Accessories

#### **Cut Sheet Feeder**

| Carial Interfedee |     |              |      |  |  |  |
|-------------------|-----|--------------|------|--|--|--|
| XB24-10           | 083 | XB24-15      | £139 |  |  |  |
| LC10/200/24-10    | £65 | LC15/LC24-15 | £125 |  |  |  |

#### Serial Interfaces

|        | Serial interfaces                 |        |
|--------|-----------------------------------|--------|
| SPC-10 | LC10; LC10-II; LC10-Col; LC15;    |        |
|        | LC24-10; LC24-15; LC-200; LC24-20 | 00 £49 |
| 8K Ser | LC-200; LC24-200; FR10; FR15;     |        |
|        | XB24-10; XB24-15                  | £64    |

#### Paper Roll Holders

LC-200; LC24-200; LC24-200 colour £29

#### **Buffers**

32K Ram Card for LC/XB24-10; 15; LC200 £55

#### Ribbons

LLX

| C10; LC10-II; LC15 | Black £4; | Colour £6  |
|--------------------|-----------|------------|
| C-200; LC24-200    | Black £5; | Colour £12 |
| B24-10; XB24-15    | Black £5; | Colour £12 |
|                    |           |            |

#### **Laser Printers**

## All Laser Printers include 12 months On-site maintenance

| Canon LBP-4                                    | 4ppm         | £580  |
|--|--------------|-------|
| Canon LBP-8 III                                | 8ppm         | £975  |
| Canon LBP-8 IIIR                               | 8ppm         | £1499 |
| Canon LBP-8 IIIT                               | 8ppm         | £1365 |
| Epson EPL7100                                  | 6ppm         | £619  |
| HP Laserjet III                                | 8ppm         | £1019 |
| HP Laserjet IIID                               | 8ppm         | £1695 |
| HP Laserjet IIIP                               | 4ppm         | £689  |
| HP Laserjet Illsi                              | 16ppm        | £2475 |
| Panasonic KX-P4420                             | 8ppm*        | £629  |
| Panasonic KX-P4450i*                           | 11ppm*       | £1015 |
| <ul> <li>Panasonic KX-4455 Postscri</li> </ul> | pt 11ppm*    | £1469 |
| Star LP-8 II                                   | 8ppm         | £929  |
| Star LP-8 Star(post)script                     | 8ppm         | £1129 |
| Star LP-4                                      | 4ppm         | £689  |
| Star LP-4PS Postscript                         | 4ppm         | £799  |
| * Now with 2 years On-                         | site warrant | у     |

#### Laser Toners

|                | Laser | ioners                |     |
|----------------|-------|-----------------------|-----|
| Canon 2, 3 & 4 | £47   | KX-P4420/50           | £19 |
| Epson GQ       | £13   | Laserjet III to III/P | £55 |
| EPL7100        | . £82 | Laserjet II/D, III/D  | £48 |
| Star LP-8      | £69   | Qume Crystal          | £42 |
|                |       |                       |     |

| Las             | er RAM | Upgrades       |      |  |
|-----------------|--------|----------------|------|--|
| • IIP & III 1MB | £65    | • EPL7000 2M   | £365 |  |
| • IIP & III 2MB | £97    | • GQ5000 512K  | £75  |  |
| • II & IID 1MB  | £64    | • KX4420/50 1M | 289  |  |
| • II & IID 2MB  | £100   | • KX4420/50 2M | £125 |  |
| • II & IID 4MB  | £155   | • KX4420/50 4M | £215 |  |
| • Canon LBP4 11 | M £129 | Star LP8 1M    | £139 |  |
| • Canon LBP8 2  | M £125 | Star LP8 2M    | £275 |  |

#### Laser Drum & Develope

| Laser Druin o       | Developer         |   |
|---------------------|-------------------|---|
| Epson Drum GQ5000   | £93 EPL7100 £129  | 9 |
| Panasonic 4420 Drum | £60 Developer £59 | 9 |
| Panasonic 4450 Drum | £93 Developer £80 | 0 |
| Qume Drum           | £76 Developer £50 | ô |
|                     |                   |   |

| Jetpage    | Postso | ript Cartrid | ge   |
|------------|--------|--------------|------|
| HP IIP/III | £239   | IID & IIID   | £240 |

#### Various Add-Ons

| _aserjet Appletalk Interface | £139 |
|------------------------------|------|
| HP Adobe Postscript          | £290 |
| Pacific Page Postscript      | £259 |
| HP Premier Font Collection   | £28  |
| Jetfont Superset             | £145 |
|                              |      |

#### **Hewlett-Packard Printers**

| £285 | Paintjet XL                       | 2999  |
|------|-----------------------------------|---|
| £480 | Quiet Jet Plus                    | £350  |
| £15  | HP Think Jet                      | £232  |
| £569 | <ul> <li>Rugged Writer</li> </ul> | £825  |
|      | £480<br>£15                       | £480 • Quiet Jet Plus<br>£15 • HP Think Jet |

# Now 3 years extended Parts & Labour warranty

| <ul> <li>Paintjet Cartridges</li> </ul>  | Black    | £19;      | Colour   | £25  |
|--|----------|-----------|----------|------|
| <ul> <li>Desk Jet 500 256K R.</li> </ul> | AM cartr | idge      |          | £129 |
| <ul> <li>HP Epson FX Emulati</li> </ul>  | on Carti | ridge for | Desk Jet | £59  |
|  |          |           |          |      |

HP Apple Talk Interfaces for £299 Paint Jet · Scan .let **POA**  Desk Jet Unlimited (Book No VAT) £19.75

#### Canon Bubblejet Printers

|                           |             |             | D'ble | Ink  |
|---------------------------|-------------|-------------|-------|------|
|                           | Printer     | CSF         | Bin   | Cart |
| BJ10E                     | £178        | £43         |       | £16  |
| BJ300                     | £320        | £88         | £65   | £12  |
| BJ330                     | £374        | £110        | £79   | £12  |
| <ul> <li>Spare</li> </ul> | Battery pac | k for BJ10E |       | £33  |

#### **NEC Pinwriter Printers**

| • P20 | £179 | • P70 | £448 |
|-------|------|-------|------|
| • P30 | £237 | • P90 | €646 |
| • P60 | £345 |       |      |

#### Epson Printers

| DFX5000       | £1059 | LQ860 Colour   | £459 |
|---------------|-------|--|------|
| DFX8000       | £1985 | LQ1050+  | £459 |
| EX1000 Colour | £428  | LQ1060 Colour  | €609 |
| FX850         | £272  | LQ2550+  | €685 |
| FX1050        | £346  | LX400  | £105 |
| FX1060        | £595  | LX850  | £146 |
| LQ400         | £156  | ACCUMULATION OF THE PROPERTY O |      |
| LQ550         | £204  | SQ850  | £425 |
| LQ850+        | £377  | SQ2550   | £628 |

#### **Cut Sheet Feeders for**

| LX400/800/8 | 50/LQ400   | /500/550 | £69  |
|-------------|------------|----------|------|
| EX800/FX80  | 00/850/LQ8 | 300/850  | £130 |
| FX/LQ 1000  | 1050/SQ8   | 50       | £159 |
| LQ 2550     | 2390       | SQ2550   | £390 |

#### Tractor Feed for

LQ800 £44; LQ850/FX850 £69; LQ1050/ FX1050 £85; LQ2500 £90; LQ2550 £90.

#### Accessories

| EX800/1000 Colour Option          | £45 |
|-----------------------------------|-----|
| EX800/1000 Colour Ribbon          | £14 |
| LQ2500 Colour Option              | £65 |
| Multifont Card for LQ550/850/1050 | £95 |
|                                   |     |

#### **Epson Printer Interfaces**

| All the | se interf | aces fit inside the printer |     |
|---------|-----------|-----------------------------|-----|
| RS232   | £32       | RS232 + 2K Buffer           | £52 |
| EEE 488 | £95       | RS232 + 8K Buffer           | £75 |

#### Printer Leads

| BBC Centronics 4' long                 | £5     |
|--|--------|
| BBC Centronics 6' extra long           | £7     |
| Compact's Special Centronics Lead      | £7     |
| Nimbus Centronics Lead                 | 26     |
| IBM/Archimedes Parallel Lead 6'        | €4     |
| IBM/Archimedes Parallel Lead 5 metres  | £10    |
| IBM/Archimedes Parallel Lead 10 metres | £15    |
| Double Ended 36 way Centronics Lead 4' | £7     |
| Double Ended 36 way Centronics Lead 6' | 63     |
| MSX Centronics Parallel Lead 4'        | £12    |
| RS232 Leads (Various)                  | P.O.A. |
| IBM Keyboard extension lead coiled     | £5     |
|  |        |

#### Concept Keyboards

| Standard A3 Keyboard with BBC Software | £143 |
|--|------|
| Standard A4 Keyboard with BBC Software | £117 |
| Archi A3 Keyboard                      | £144 |
| Archi A4 Keyboard                      | £118 |



**CREDIT CARD 24 HOUR** Ansaphone Hot Lines (0923) 50234 or 33383

#### **Plotters**

| • HP7440      | £415        | • HP7475   | €599  |
|---------------|-------------|------------|-------|
|               | Roland      | Plotters   |       |
| • DXY1100     | £499        | • DXY1200  | £629  |
| • DXY1300     | £830        | • DXY2500  | £2375 |
| • DPX3500     | £3289       | Sketchmate | £315  |
| Roland plotte | er Pens Fil | re tin     | 67.50 |

| Listing Paper (Perforated                        | )     |
|--|-------|
| • 1,000 Sheets 9.5" x 11" Fanfold Paper          | 27    |
| • 2,000 Sheets 9.5" x 11" Fanfold Paper          | £1    |
| • 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold     | £2    |
| • 1,000 Sheets 15" x 11" Fanfold Paper           | £     |
| • 2,000 Sheets 15" x 11" Fanfold Paper           | £16   |
| • 1,000 Sheets true A4 Fanfold Paper 70gms       | £11   |
| • 2,000 Sheets true A4 Fanfold Paper 70gms       | €2    |
| Teleprinter Roll (Econo paper)                   | £4    |
| (All our Fanfold paper is Micro perforated leave | ina : |

smooth clean edge when the tractor feed strips are

Carriage 1K Sheets £2.50, 2K Sheets £3.00

#### **Printer Labels**

#### (On continuous fanfold backing sheet)

| 1,000 90 x 36mm (Single Row) | £6.00 |
|------------------------------|-------|
| 1,000 90 x 36mm (Twin Row)   | £6.25 |
| 1,000 90 x 49mm (Twin Row)   | £7.50 |
| 1,000 102 x 36mm (Twin Row)  | £6.75 |

#### Laser Printer Labels on A4 Sheets

| 3750 | 70 x 29mm (3 Rows) | £13.50 |
|------|--------------------|--------|
|      | 70 x 37mm (3 Rows) | £13.25 |
| 2625 | 70 x 42mm (3 Rows) | £13.00 |

#### **Printer Ribbons &** Various Dust Covers

| Type                  | Ribbons | <b>Dust Covers</b> |
|-----------------------|---------|--------------------|
| Brother HR15/20       | £6.00   |                    |
| BBC Micro             |         | £3.50              |
| BBC Master            | 1004    | £4.00              |
| Archimedes Micro pair |         | £9.00              |
| Citizen 120D          | £2.75   | £4.50              |
| DMP2000               | £2.75   | £4.75              |
| DMP4000               | £3.75   | £4.85              |
| EX800/1000            | £3.50   | £5.00              |
| RX/FX80/85/800/MX80   | £2.95   | - T                |
| FX/MX/RX100/1000      | £3.95   | =                  |
| Kaga/Taxan KP810/815  | £3.25   | £5.00              |
| LQ400/500/550/800/850 | £3.25   | 26.00              |
| LQ1050/LQ2500         | €4.00   |                    |
| LX80/86/800/850       | £2.75   | £4.50              |
| LX400                 | £3.50   | £5.00              |
| M1009/GLP             | £2.95   | £3.75              |
| NEC P2200             | £4.50   | £5.00              |
| Panasonic KX1080/81   | £3.25   | £4.75              |
| Panasonic KX-P1124    | £7.50   | £5.00              |
| SQ2500                | 28.00   | £5.50              |
| Star LC10/NL10        | £2.75   | £5.00              |
| Star LC24-10          | £2.95   | 26.00              |
| Olivetti Ink Jet      |         |                    |
| Cartridges (set of 4) | £6      |                    |

#### **Original Panasonic Ribbons**

|                 |   |   | _                                   |
|-----------------|---|---|-------------------------------------|
| Guaranteed to   | last 3  | million characters  |                                     |
| for KX-P1081,   | 1592  | & 1595  | £6                                  |
|                 |   |   | £7                                  |
| for KX-P1540    | 83  | P155 for KX-P1624   | 83                                  |
| r Ribbons for K | X-P10   | 081, 1592 & 1595  |                                     |
|                 |   | £9 ea   | ach                                 |
|                 | for KX-P1081,<br>for KX-P1180<br>for KX-P1540 | for KX-P1081, 1592<br>for KX-P1180 £7<br>for KX-P1540 £8<br>or Ribbons for KX-P10 | r Ribbons for KX-P1081, 1592 & 1595 |

#### **Professional Printer Stand**



The professional printer stand takes printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is

printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding

> 80 Column version £24 (carr. £3) 132 Column version £29(carr. £4)

#### Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer, These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires).

#### (Ideal for School environments)

| Connects | Serial | Centronics |
|----------|--------|------------|
| 2 to 1   | £16    | £17        |
| 3 to 1   | £22    | £24        |
| 5 to 1   | £32    | £36        |

(Cables extra at £6 each. Please specify type required when ordering)

#### 2 Way Compact Printer Switch

A handy 2 way printer switch. Enables one micro to be connected to 2 printers or vice versa.

Centronics £18; Serial £17 (Cables extra at £6 each)

#### **Auto Printer Sharer Switch**

| Serial | Centronics |
|--------|------------|
| £40    | £45        |
| £62    | £59        |
|        | £89        |
|        | £40<br>£62 |

#### 256k Multi Spooler

These Auto Centronics Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

| • 2 ln/2 out | £135 | • 4 In/2 out | £169 |
|--------------|------|--------------|------|
| • 8 In/1 out | £199 |              |      |

#### **Compact Converter Units**

£36 Parallel to Serial £37 Serial to Parallel

#### Laser Direct



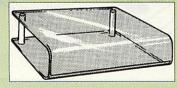
Laser Direct Qume 6ppm complete

 Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers £325

 LPB 4 Printer plus High Res Card £899

LPB 8III Printer plus High Res Card £1299

### Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version 136 Column version £16 (carr £3) £20 (carr £4)

All prices are exclusive of



| Quest Mouse III & Quest Paint  | £59 |
|--|-----|
| Quest Mouse III, Quest Paint, AMX  |     |
| Stop Press & Pagefont  | £89 |
| Quest Mouse III only   | £30 |
| Quest Paint Software only  | £34 |
| Quest Font Disc (22 Text Fonts)  | £15 |
| Quest Mouse Mat (Red or Blue or  |     |
| Green please specify)  | £3  |
| <ul> <li>Quest Colour Dump Disc – This new<br/>software allows you to print direct from<br/>Quest Paint to your Integrex Colour</li> </ul> |     |
| Printer  | £18 |
| (P.S. Quest Paint is not compatible with BBC Compact)  |     |

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software



Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

£30

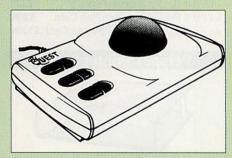
ConQuest ROM Package (Price includes software in ROM and a comprehensive Manual). (Not Compatible with BBC Compact)

#### **ARCHI MK II MOUSE**

An extremely reliable replacement mouse for Archimedes Micro £32

#### Quest - Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £27 QT-20 Archimedes Version £30

#### RB2 Marconi TRACKER BALL

| RB2 (AMX/Quest compatible) | €4  |
|----------------------------|-----|
| RB2 including Quest Paint  | £7. |
| RB2-A for Archimedes       | £41 |

#### THE NEW Mk III AMX MOUSE

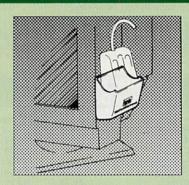
## Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

| MOUSE MAT   | £3  |
|---|-----|
| AMX MOUSE ONLY  | £29 |
| AMX SUPERART Package AMX STOP PRESS – A Desktop publishing software. Works with | £34 |
| Keyboard, Joystick or a mouse PAGE-FONTS – Over 20 Fonts for                    | £32 |
| use with AMX Pagemaker  | £13 |
| AMX DESIGN (ROM)  | £55 |
| AMX XAM Educational   | £15 |
| AMX EXTRA EXTRA AMX MAX A gem of desktop  | £16 |
| (ROM)   | £20 |

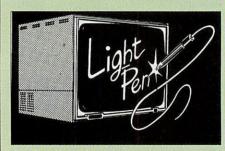
#### **WE Mouse House**



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk.

It protects it from damage when not in use, yet within easy reach when you need it again. At £4 it does not cost a rodent's ransom.

Price £4



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

#### **FLEET STREET EDITOR**

| Software pack for BBC Micro   | £33 |
|-------------------------------|-----|
| Software pack for the Master  | £39 |
| Admin Xtra Disc Utility       | £13 |
| Fonts N Graphics Disc Utility | £13 |

#### BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

### £109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

#### The Beeb HandScan

Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer. The HandScan plugs directly into the 1MHz bus on

the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware



Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

#### The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw slided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

#### Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill,

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined

#### Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

#### The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individully proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack Wapping Editor plus Mouse

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

#### Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To A wide o screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

#### Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.

Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions. £12

#### **Wapping Font Disc 2**

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs £13

#### **Archi A4 Scanner**



This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the IHELP application on the Acorn applications discs. The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, discrements at the state of the stat

diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control

achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

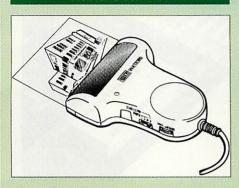
#### **New Low Prices:**

| Archi A4 Scanner          | £349 |
|---------------------------|------|
| Sheet Feeder for above    | £95  |
| Scanner + Sheet Feeder    | £419 |
| (Dealers Inquiry welcome) |      |

#### Computer Concept Scanlight

| Scan-Light A4                                     | £375 |
|---|------|
| <ul> <li>Scan-Light A\$ + Sheet Feeder</li> </ul> | £475 |
| Scan-Light Junior mono                            | £178 |
| Scan-Light Junior 256                             | £215 |

#### Archi Mk II **Hand Scanner**



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £149. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

#### SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

#### SCANNER SOFTWARE

Full use is made of the windowing and the multitasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are.

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting. X and Y flip.

Edge detection which turns solid objects into

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version £149 AHS-3 Archi A3000 Version £175

#### Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- · Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)
- . BBC, B and B+ compatible.

ONLY £18

#### **BBC B Low Profile Cartridge System**

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

Complete System

Spare Cartridges

£2.75

Spare Rack

£1.65

#### ROM Cartridges for the **BBC Master**

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin £8; Quad £13

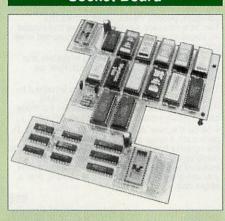
#### **User Port Splitter Unit**



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at £22

#### Solderless Sideways ROM Socket Board



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to
- No soldering required. Very low power consumption. Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
  Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions

Price: Only £35

Battery Backup fitted £39 Battery Backup only £3 16K Sideways RAM £8

 Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8



#### Commander **Joystick**



Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port no interface needed
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation. Trim adjusters for both X and Y axes for fine
- centre adjustment. Convenient stick mounted fire button with additional base buttons.

Launch Price: £15



## ARIES CORNER

#### **B-32 Shadow RAM Card**

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

as sideways HAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the

other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved \*FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend

B32's sideways HAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system. The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets

Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: £59

#### Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal

Price:

Aries B-12 £36 Aries B-12C

#### Aries B-488 **IEEE-488 Interface Unit**

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

#### £238

#### Voltmace Joysticks

| Pelta 3B Single Joystick              | £10 |
|---------------------------------------|-----|
| Oelta 3B Twin Joysticks               | £15 |
| Delta 3C Joystick for Compact         | £10 |
| Delta 14B Single Joystick             | £11 |
| Delta 14B/1 Adaptor Module            | £12 |
| ransfer Software Disc-Tape            | £7  |
| Delta-Cat A mouse eliminator Joystick |     |
| or the Archimedes                     | £24 |
|                                       |     |

#### **Delta Base B**



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

#### ROM/RAM Card



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
  Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
  Software Write protect for ALL RAM.
  Read protect for CMOS RAM (ALLEVIATES)
- crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F). Automatic write to currently selected RAM
- socket for convenience.
- FREE utilities disc packed with software.
  Compatible with our DDFS board, 32k RAM
- Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

#### PRICES:

- ROM/RAM card with 32k dynamic RAM £45
- ROM/RAM card with 64k dynamic RAM £59
- ROM/RAM card with a massive 128k dynamic RAM £99

(carriage on ROM-RAM Card £3)

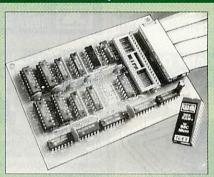
#### **OPTIONAL EXTRAS:**

| • | 16k plug-in Static RAM kit      | 29      |
|---|---------------------------------|---------|
| • | 16k Dynamic RAM for Upgrade     | £13     |
| • | Battery backup                  | £3      |
| • | Read and Write protect switches | £2 each |
|   | Complete ROM-RAM board          |         |
|   | All options installed           | £115    |

#### P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

#### 32K Shadow RAM/Printer **Buffer Card Expansion Board**



#### A MUST FOR WORD PROCESSING

Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- · Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (\*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.
- Unique facility to turn ROMs off and on again.
   Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

#### Only £54 (carr £3)

(Price includes a comprehensive manual and the ROM)

#### **BBC SOFTWARE'S Popular Educational Software**

| <ul> <li>Maths with a Story 1</li> </ul> | (Disc). 4 primary level |
|--|-------------------------|
| maths programs                           | £20.0                   |

Maths with a Story 2 (Disc). 4 further \$20.00 maths programs.

Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design &

colouring programs. £17.00 ECOLOGY O-Level program. £20.00

POLYMERS O-Level program. £20.00 Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified £20.00

according to your own rule. ADVANCED TELETEXT SYSTEM £8.65 PERIOD TABLE SOFTWARE £20.00 Computers at Work - Primary £17.35

Introducing Geography 11-17 years £17.50 Electric Fields 6-14 years £11.25

Espana Viva - 3 Discs £19.95 WHITE KNIGHT Chess game £16.00 £29.00

A Vous La France

More Educational Software

• FUN SCHOOL 2 - Red: Under 6 yrs €12.00 • FUN SCHOOL 2 - Green: 6-8 yrs £12.25 FUN SCHOOL 2 - Blue: 8 yrs+ . £12.50 FUN SCHOOL 3 – Red £19.95 • FUN SCHOOL 3 - Green £19.95 • FUN SCHOOL 3 - Blue

 Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+ £26

£26

£26

More French Games - Another 6 games 12 years+

 Au Restaurant and Accident de Route 12 years+

 Boulogne and Oh-Les – 2 programs for £26 Letters to French Penpals - 11 years+ £26

· French Programs with Henri Beret - The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games, 11-16 £22

 Six German Games – Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+

 More German Games – Aimed at pupils in their 2nd year of learning German. 12 years+

• The Cloze Program - Using context clues to predict is much more than a gap filling exercise.

 An Introduction to Electronics – Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years

 Computer Control – This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years £26

 The Nuclear Reactor – An interactive, menu. driven program for GCSE pupils. Demonstrates & explains nuclear fission & the chain reaction. 14-16 years

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 Yes Chancellor – A chance to take over number 11 at Downing Street. 12 years+ £18 Letters & Pictures - Introduces phonic skills to

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 Help Your Child learn Basic Map work No. 2 (9-14 years)

Pirate – Educational Adventure (8-14 years) £15

Spelling Week by Week (6-14 years)

#### **Archimedes Software**

| <ul> <li>Bookbinder</li> </ul>      | £43     | DigiSim                       | £35 |
|-------------------------------------|---------|-------------------------------|-----|
| BUMPER DISC                         | £14     | Droom                         | £19 |
| Bumper Disc 2                       | £14     | <ul> <li>Jiglet</li> </ul>    | £27 |
| Craftshop 1                         | £26     | <ul> <li>Jigsaw</li> </ul>    | £28 |
| Craftshop 2                         | £26     | <ul> <li>Numerator</li> </ul> | €60 |
| <ul> <li>Desktop Stories</li> </ul> | £35     | <ul> <li>Snippet</li> </ul>   | £26 |
| <ul> <li>Fun School 2A I</li> </ul> | Red (u  | p to 6 years)                 | £12 |
| <ul> <li>Fun School 2A</li> </ul>   | Green   | (6-8 years)                   | £14 |
| <ul> <li>Fun School 2A I</li> </ul> | Blue (8 | 3 years +)                    | £14 |
| <ul> <li>Gate Array Tead</li> </ul> | ching S | System                        | £68 |

Continued  $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$ 

#### **Computer Concept's** ROMS

Communicator £49 £22 Disc Doctor Inter BASE £49 Inter CHART £25 Inter SHEET £37 Inter WORD £36 Mega-3 ROM £76 Spell Master £42 Wordwise £24

## Wordwise plus

£40

We are giving away absolutely FREE, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

## Word-Rid

#### The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses. Text transfer options.
- Chapter marker.
- Epson printer codes function key
- option. Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document. Multiple file options for print and
- Address finder.
- Label printer.
- Mail-merger
- Number/delete/renumber.

Clear test-segment area. BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

#### **Acorn ROMS**

| View 3.0 ROM                        | £45      |
|-------------------------------------|----------|
| Viewsheet (Acornsoft)               | £36      |
| Viewstore                           | £36      |
| Viewspell with 80 track             |          |
| disc                                | £25      |
| Viewplot Disc                       | £20      |
| (Please specify for Master 128 or 0 | Compact) |
| View-Index                          | £12      |
| Overview packs 1 & 2                | £65      |
| Hi-View                             | £38      |
|                                     |          |

#### MINI OFFICE II

|                            | -       |
|----------------------------|---------|
| DISC Version for BBC       |         |
| B & B+                     | £14.00  |
| DISC Version for BBC       |         |
| Master                     | £16.00  |
| DISC Version for the       |         |
| Compact                    | £18.00  |
| (Mhan ordering please spec | ify for |

(When ordering please specify for which Micro & 40 or 80 track Disc)

All prices are exclusive of VAT

#### **View Printer Driver Discs**

Epson FX & RX 80 £10 Juki & Brother HR £10

#### **View Printer Driver** ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100,

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript. Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redifinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips.

Price: Only £29



**CREDIT CARD** 24 HOUR **Ansaphone Hot Lines** (0923) 50234 or 33383

#### **OFFICE** MASTER



CASHBOOK - A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS - Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST - A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques

EASILEDGER - A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS - Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL - Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only £21 (Disc)

#### **OFFICE** MATE



- DATABASE
- BEEBCALC SPREADSHEET
- **BEEBPLOT GRAPHICS**

DATABASE - Set up a computerised card index system with powerful search facilities.

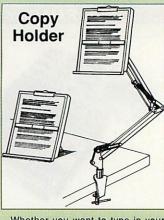
SPREADSHEET - Offers many calculation and editing features

BEEBPLOT - Provides visual representation from Spreadsheet data.

Only £10 (Disc)

**Acorn Speech Synthesizer** package complete, for the **BBC B Microcomputer** 

> Special Offer £14



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top £7 (carr. £3) Angle poise £12 (carr. £3)

#### The Epson RX/FX/KAGA **Printer Commands Revealed Handbook**

#### **Printer Commands Revealed**

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities - he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

**ALL PRICES EXCLUDE** 

#### BOOKS (No VAT on Books)

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| 30 Hour BASIC (BBC Micro)                            | £12.95       |
|  |              |
| 1st Word Plus Rel. 2 Manual                          | £10.00       |
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|  | 04405        |
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| the Complete   | £5.95        |
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| A Beginners Guide                                    | £6.50        |
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| Viewsheet & Viewstore Dabhand Guide                  | £12.95       |
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|    |  | £22.95 |
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## New Release ACORN TO PC

#### Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes and the BBC A3000) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory? 'ACORN TO PC' enables you to

change over painlessly. It shows clearly and quicily how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way — from Acorn to MS-DOS, or from MS-DOS to Acorn.

'ACORN TO PC' also acts as a handy reference guide to all Acorn star commands and their MS-DOS equivalents. It also has an extensive and readable explanation of the directory tree and hierarchical filling systems in general. Both DFS and ADFS Acorn systems are covered.

'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £15.95 (No VAT)

# The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material. Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc, and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail. including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work - even giving advice on writing and marketing your own programs.

A book you will enjoy to use as a reference, or read from cover to cover, over and over.

Only: £14.95 (No VAT)

#### The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

given.
It is possible to gain a full
understanding of the mouse from this
manual. For those not interested in
exactly how the mouse functions,
complete example programs are also
included. These may be typed directly
into the micro, without the need for any
understanding of the hardware or
software involved, enabling the mouse
to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

#### Beeb PC (BASIC)

Beeb PC Basic is designed for program authors wishing to convert programs so that they will run on IBM personal computers. To convert BBC BASIC programs manually can waste days of valuable time with every occurrence of common statements such as PROC, DEFPROC, TAB, having to be changed. Beeb PC (BASIC) automates many of these changes, and will convert majority of BBC statements that are invalid for IBM BASIC into equivalent acceptable statements. In addition BBC BASIC data files can be converted to IBM BASIC format, with support provided for all BBC data formats:- INTEGER, REAL & STRING.

Price: £38

#### Beeb DOS 3.0

(Now reads Archimedes Discs)

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

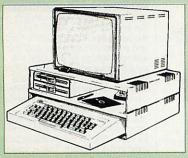
Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual. (Will only work on 360K Disk Drives & read only ADFS and Watford DDFS – not DFS).

Price: £39 (Please write in for technical literature)

Continued  $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$ 

#### Plinths for the BBC B & Master 128K Micros



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth 420 x 310 x 105mm £13 420 x 310 x 210mm £24 Double BBC Plinth Single Master Plinth 490 x 310 x 105mm £14 Double Master Plinth 490 x 310 x 210mm £26 (Carr. Single plinth £2; double plinth £3)

#### ADDER



The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems.
  Generates header code for RFS ROMs to allow
  Basic programs etc. to be stored in EPROM.
  More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£65 (£5 Carr)

#### **TEX EPROM ERASERS**

survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- ERASER EB Standard version erases up to 16 chips.
- FRASER GT Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened.
- Spare UV tubes.

**CREDIT CARD 24 HOUR** Ansaphone Hot Lines (0923) 50234 or 33383

#### Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

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#### Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

#### Aerosol Dust Spray

Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces.

#### Spares for BBC Micro

| UHF Modulator    | £4       | 16MHz Crystal   | £2  |
|------------------|----------|-----------------|-----|
| Speaker Grill    | £1       | 17.734 MHz Xtal | £2  |
| Speaker          | £3       | 32.768MHz Xtal  | £1  |
| Keyswitch        | £1.50    | BBC B Refurbi   | sh  |
| Master PSU       | £59      | Casing          | £25 |
| Master Keyboard  | £62      | Keyboard        | €46 |
| Master Casing    | £49      | Power Supply    | 259 |
| Replacement Flex | cible 17 |                 |     |
| Connector        |          |                 | €4  |

#### Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching. switching.

Protection for only £8.50

#### 4 Way Mains **Distribution Socket**



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

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#### Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

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#### ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole £2 body of any 24 or 28 pin chip.

Metal Chip Extractor

#### 28pin DIL Header Plug

SOLDER type £1.50 IDC CRIMP type £1.95

#### 8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

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#### **Connecting Leads**

(All ready made and tested)
CASSETTE LEADS 7 pin DIN Plug to 3 pin DIN Plug + 1 Jack Plug £2.50 to 7 pin DIN Plug £3.00 to 3 Jack Plugs £2.50 6 pin DIN to 6 pin DIN Plug (RGB) £3.00

#### **Disc Drive Power Leads**

Supply from BBC power supply to standard Disc Drive Connection: Single £3.00; Dual £3.75

#### **Disc Drive Interface Leads**

BBC to Disc Drives Ribbon Cable Single £4 Twin £6

#### Miscellaneous Connectors

|                       | Plugs | Sockets |
|-----------------------|-------|---------|
| RGB (6 PIN DIN)       | 50p   | 75p     |
| RS423 (5 pin Domino)  | 70p   | 80p     |
| Cassette (7 pin DIN)  | 40p   | 95p     |
| ECONET (5 pin DIN)    | 35p   | 50p     |
| Paddles (15 pin 'D')  | 150p  | 250p    |
| Disc Drive Plug 4 way | 100p  |         |
| 6 way Power Connector | 120p  | 150p    |
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Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

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(12V5) 27128-250nS

27C101G (1 Meg)

(21V) 27256-2

4013 4020

4164-10

4816 RAM

41256-8 41256-10 6264LP-8K

6502A CPU 65C02 3M

6522A 62256ALS-15

62256P-12

6818 6845SP

68B50

68B54

7438 74LS00

74LS00 74LS04 74LS10 74LS123 74LS163 74LS244

74LS245 74ALS245

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#### **CHIP SHOP Assorted**



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|-------------------------------|------------|
| ACORN ADFS<br>ACORN BASIC 2 p | £25        |
| User Guide                    | £22        |
| Acorn BCPL                    | £42        |
| ACORN DNFS                    | £17        |
| Acorn FORTH                   | £32        |
| Acorn Graphics                | £25        |
| Acornsoft C Disc              | £36        |
| Acorn LISP                    | £19        |
| Acorn OS B+                   | £25        |
| Acorn OS 1.2                  | £14        |
| Basic Editor                  | £24        |
| BBC PCB Designe               |            |
| Beebmon                       | £22        |
| Buffer & Backup               | £20        |
| Communicator                  | £49<br>£25 |
| Dump Out 3<br>EPSON NLQ ROM   |            |
| Graphics Extensio             |            |
| GXR-B                         | £21        |
| GXR-B+                        | £22        |
| ICON Master                   | £28        |
| Logotron LOGO                 | €43        |
| MASTER OS RON                 |            |
| Master ULA (47)               | £15        |
| Master ULA (60)               | £10        |
| Micro Prolog                  | £25        |
| Microtext Disc                | £46        |
| Microtext Rom                 | £199       |
| NLQ DESIGNER                  | £25        |
| Numerator - Arch              |            |
| Numerator - BBC               |            |
| Pendown ROM                   | £32        |
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Rom Manager SERIAL ULA TED

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£28

£32

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£1.00 £1.00 Termulator B, B+ £1.00 £3.00 Termulator Master Video ULA £3.00

**ULTRACALC II** 

1Mb OS ROM



Watford's NEW Innovative IDE interface card brings the latest advances in PC hard disc technology to within reach of the Archimedes user. Because of the integration of the controller and drive electronics onto one compact board, Watford Electronics have been able to include extra features into the drive, such as Caching, where tracks are buffered in fast memory, reducing access times and increasing throughput. All these benefits make IDE drives far more attractive than conventions STECE drives as SCSL

benefits make IDE drives far more attractive than conventional ST506 drives or SCSI.

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filling system IDEFS, up to two drives can be attached to

each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the IFonts application.

A powerful security feature has been provided with the two unique commands \*IDELock and \*IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The IIDEForm Write Protect option is particularly useful in conjunction with \*IDELock as it will prevent any unauthorised delation of data. deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

#### Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification Fast 16 bit MEMC interface interrupt driven to support background disc operations
  5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

#### Software

- Conforms fully to the Acorn IDE Specification All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon IIDEForm, WIMP based configuration and
- formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead

  • IIDEFSDisk, creates PC emulator hard discs

#### \*Commands

\*IDELock \*IDEUnlock 1 DEFS

Selects the IDE filing system 'IDEFS'.

\*IDEDrives

Displays the configuration and native characteristics of installed drives.

\*Configure IDEFSDirCache \*Configure IDEFSBuffers

\*Configure IDEFSDrive

Typical transfer speeds

Prairie Tek 20Mb 650K bytes per second 43Mb Seagate 800K bytes per second

#### **Prices**

| Part No. | Capacity | Access Speed | Price       |
|----------|----------|--------------|-------------|
| ADA 0520 | 44Mb     | 28mS         | £249        |
| ADA 0530 | 100Mb    | 16mS         | £395        |
| ADA 0570 | 200Mb    | 15mS         | £535        |
| ADA 0580 | 330Mb    | 15mS         | <b>EPOA</b> |

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000

#### **Internal Hard Disc Drives** for A3000

ADA 0700 21Mb 23mS ADA 0720 44Mb 28mS ADA 0730 89Mb 18mS

**£TBA** Available **£TBA** Soon

**★£315** 

Supplied complete with Podule, Fan, Cable & Fitting instructions.

★ Tentative Launch Price

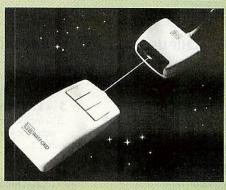
#### Archi IDE Hard Cards



These revolutionary new hard cards for the A300 and A400 series Archimedes are unbelievably easy to install - you simply slot one into any vacant podule backplane slot in the rear of your computer. The fast 2.5" miniature hard drives are mounted onto the professionally designed cards, and are supplied with the fully Acorn-conformant IDE Filing System ready installed and ready to run. A novel feature of the hard cards is that they can be easily removed and transported to another Archimedes, for example to make a hard disc backup, or to transfer saved files from work to home etc. Security of files on the hard disc is ensured by our unique security password lock, which allows files to be read only, but not overwritten or deleted ideal for use in school applications where the integrity of your master software needs to be retained.

**ADA 0650** 21Mb 23mS £345 **ADA 0660** 44Mb 28mS £495 **ADA 0670** 89Mb 18mS **£TBA** (Can be used as a Removable Hard Drive)

#### **Archimedes Cordless Mouse**



Ever found that using a mouse on a busy desktop has its problems? The cable is always being caught up in papers, tangled round equipment and other cables etc, and what about that cup of coffee spilled over vour work!

Watford Electronics' new Cordless Mouse solves these problems by removing the cause for concern - replacing the cable with a simple infra red link. It still provides all the speed and easy control of a conventional mouse, but with complete freedom. In use, there are no operating differences between the standard mouse and the new cordless mouse so all mouse functions and mouse driven RISC software will be fully compatible. Pinpoint accuracy is ensured by a unique Accelerator button, which, when pressed, moves the pointer by just a tiny amount for a large slow movement of the mouse, but by a large amount for a quick wizz of the mouse.

#### Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

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## **Archimedes Software**

Disc 7 - Chess

A Chess program that takes full advantage of RISC OS, installing itself on the icon bar and running on the desktop in a window. You can work with other programs whilst you play. Risc User July 1991 said: "Chess is an absolute bargain. playing at a comparable level it always beat Micro Power's offering. ...this has to be the one to go for".

Acorn User October 1991 said: "It plays an excellent game".



Disc 8 - CrossStar 2.XX Crossword puzzle solver RISC OS compliant desktop Crossword puzzle solver. 200,000 word dictionary. Solves interlocking clues. Editable/ user definable dictionaries. Saves grids as Draw files. Browse through dictionary. Add new words to dictionary.





Spark, allows you to store files and directories in archive files in a very compressed form. e.g. sprites often take up only 10% of normal space. Files in archives, can be accessed just like files in disc directories. Reads these formats, zoo, zip, lzh, UNIX and Archie Tar, Compress. Writes PKarc, SEA/PC arc.



Disc 32 - Charm language and development environment Charm, is a high level language like Pascal or C. This implementation, includes a compiler, linker and assembler, with an editor, and a desktop environment to use them from.

#### Disc 33 - Panorama. Draw the World.



180,000 coordinates outlining the lakes, rivers, continents, borders etc. of the World and a program that can produce Draw files from them. You can make maps of any part of the world and then use them in DTP programs. Includes positions of nearly 1000 cities. Mercator and perspective projections. Discs cost £5.99 each inclusive Buy four claim one free!

#### **RISC OS Terminals Plus**

A new Archimedes communications program. Features:

- Zmodem, Ymodem, Xmodem1K, Xmodem, Kermit, CET and ASCII file transfer protocols.
- VT52, VT100, VT220, Viewdata, Minitel/Teletel Terminals.
- Terminals are fast, accurate and work in normal screen modes.
- ACF script language for automated logons and setups.
- Host mode and Kermit server functions.
- Fully RISC OS compliant. Exchange data with other programs.
- Written in assembler, for compactness and speed.

Programs, manual and case £17.97 inclusive.

#### Clip Art Packs

Each pack consists of three discs filled with good quality black and white sprites suitable for use in DTP. The files are compressed using Spark so many 100's of pictures and Mb. come in each pack. Suitable for use with Ovation, Impression etc.

Pack #1: Decorative alphabets. Anatomy. Animals. Astrology. Books. Stylish pieces of text. Pointers-hands and arrows. Outlines for cards. Pack #2: Cartoon and comic characters. Flowers. Foods. Miscellanea. Pack #3: Music. TV and folklore monsters. Mythical and religious beasts and objects. People and celebrities. Space, space travel. Pack #4: Peoples heads. Christmas. Easter. Halloween. Transport, boats, cars, trains planes. Old cars. Company logos and icons. Pack #5: Woodcuts. Whimsy. Sports - football, baseball, tennis etc. Pack #6: Cartoons. Grey scale pictures. People. Animals.

Each pack is £5.99 inclusive.

David Pilling, P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR. Free Air Mail delivery on overseas orders. Extensive range of other Archimedes software available (programmers tools, games, utilities, art), please send for free list.

#### **COMPATIBILITY KEY**

- **B** BBC B compatible
- B BBC B+ compatible
- M Master compatible
- **C** Master Compact compatible
- Electron compatible
- Archimedes compatible
- BBC A3000 compatible



#### OVER ON BBC, TOO!

BAU regular, Andrew Pepperell, earns himself this month's top award for his BBC version of Wire-World. The original Archimedes version was written by Peter Haynes and appeared in issue 101 (December 1990).

WireWorld is a cellular automaton that mimics the behaviour of electrons within electrical circuits. From four basic cells it is possible to construct diodes, OR gates, inverters and, therefore, any other logic gate - even simple memory elements are possible.

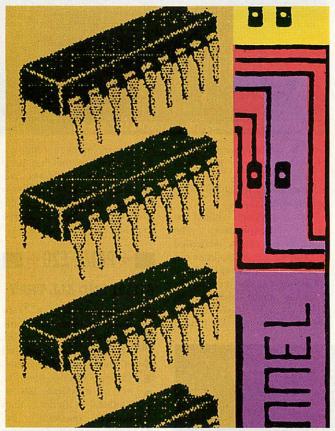
Andrew has supplied two listings. First run WWsre, which will assemble and save WWcode - the machine code needed by the main program (WWorld8). Upon running WWorld8, a four-item menu will be shown. From here you can load and save circuits, edit the current one or start the automaton proper.

In Wireworld's editor, the arrow cursor can be moved with the usual Z, X, / and: keys. RETURN plots a piece of wire, H an electron head, T an electron tail. DELETE can be used to remove any of these. In addition, SHIFT-B clears the entire screen, SHIFTw sets everything as 'wire' and SHIFT-R removes all the electron heads and tails (leaving them as wires). ESC will take you out of the editor (and also the main menu).



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| <b>★INFO COMPATIBILITY TABLE</b> |         |            |               |                |     |  |
|----------------------------------|---------|------------|---------------|----------------|-----|--|
| LISTING                          | NAME    | BBC B      | MASTER        | ELECTRON       | ARC |  |
| Info 1                           | WWSrc   | *          | *             | *              |     |  |
| Info 2                           | WWorld8 | *          | *             | *              |     |  |
| Info 3                           | SWAT    | Not in the | ne yellow pag | ges, disc only |     |  |
| Info 4                           | Surface | *          | *             | *              | *   |  |
| Info 5                           | LASrc   |            |               |                | *   |  |
| Info 6                           | Henon   | *          | *             | *              | *   |  |
| Info 7                           | Creepy  |            |               |                | *   |  |
| Info 8                           | Rockets |            | ALL THE SER   |                | *   |  |
| Info 9                           | Bubbles |            | Hotel San B   |                | *   |  |
| Info 10                          | Tree2   | *          | *             | *              | *   |  |
| Info 11                          | Rope    |            |               |                | *   |  |
| Info 12                          | JDUP    | *          | *             | *              | *   |  |

When G is pressed, the animation starts. It will continue until you hold down ESC until the end of a frame.

The workings of both the Archimedes and eight-bit versions are identical, though the components have different internal values.

The main loop of the code first plots the current circuit on the screen and also copies it to a 'safe' area. This ensures that all the interactions between squares happen at exactly the same time. The grid is then examined piece by piece and the appropriate actions are taken. Blank squares still remain blank.

Electron tails become wires, electron heads become electron tails while wires need to examine their eight neighbours to determine their behaviour. If they have one or two surrounding electron heads then themselves become heads. Any other value, meaning zero or more than two, and they remain as wires.

Like the Archimedes version, the current and 'old' grids are held in memory at one. The 32-bit version also holds the original unanimated grid. Space restrictions meant that this had to go! The only major difference is the speed. Although this can be partially attributed to the different prosevere memory cessors. restrictions mean further cuts in speed.

The 80×64 grids have to be squashed into 1280 bytes with two bits used per square. Unfortunately the extra bit shuffling required to deal with this takes a heavy toll on the poor 6502. Likewise, the Archimedes version stores the screen address for each of the grid positions, while the BBC R grid positions, while the BBC can only just manage the start o of each line. Many routines within the code rely on this within the code rely on this information so, regrettably, the speed of the automaton isn't speed of the automaton isn't up to that of the electrons it simulates!

On a slightly different subject, Andrew was inspired by my sinusoidally, scrolling text demo in the August issue of BAU, and has come up with a new program that takes a slightly different approach to the whole idea.

In SWAT, individual letters are altered to fit the sine wave, but there is no vertical movement of the letters as they scroll. Andrew merely supplied us with a \*RUN-able program, so it is only available on the monthly disc. We would be very interested to see any other eight-bit demos that may be floating around out there - so anything the Archimedes can do ...?

### ★PRIZE £20★

#### SURFACE MOUNTAINS

B In May's Risc Revue. James Gallagher threw B some light onto 3D M plotting with a rather nice C 'solid' surface program. Alas, being Risc Revue, this was Archimedes only. Six months on and, sure enough, here's the BBC version courtesy of Paul McKenzie. Needless to say, it's not quite as pretty as the 32-bit version, but Paul has used a monochrome palette so you'll actually get a better effect from a mono monitor or black and white TV! This is an old trick, but it's very effecEIGHT-BIT USERS CAN NOW GET TOTALLY WIRED...

tive. If you arrange the eight colours in order of brightness - 0, 4, 1, 5, 2, 6, 3, 7 - there is a rather uncanny pattern to the colour numbers.

Paul's program should be fairly self-explanatory. The value of step can be decreased to produce a more accurate but slower plot or increased for a quick and chunky version. The variable angle controls the viewing angle. If you change this, you may find you'll need

to change (or even remove!) the shadow, as this has been rather bodged in! PROCplot deals with the 3D transformation and should be left alone. However, FNgy can be altered to produce different surfaces.

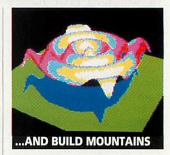
## ■★PRIZE £20★I

#### 051191 AND ALL THAT

Regular readers of \*Info should recognise the name B of Jan Vlietinck - his Coral program appeared C in the September issue. This was just one of a disc full of excellent demonstrations. Rather than simply renaming magazine Vlietinck User, we plan to print the best of these over a number of issues. What with it being the November issue, we thought his Rockets program was the most appropriate.

There's not really much to say about the program - just type it in, light the blue touch paper and retreat to a safe distance with a toffee apple!

The program was designed to run on an Arm2 and you may find it runs a tad too fast with an Arm3 switched on.



## ■★PRIZE £25★I

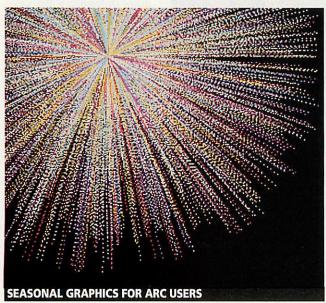
#### THE HENON CURVE

Gareth Eley of Port Talbot has been fiddling away B and come up with a short program that generates a map of the Henon Curve. E Rather than wince my mords trying to explain the program myself, I'll let Gareth take the floor:

The program Henon generates a map of the Henon curve which is a two-dimensional map first encountered by the French astronomer Henon. It involves the development of two variables according to the two rules:

$$x' = 1 + y - A.x^{2}$$
  
 $y' = B.x$ 

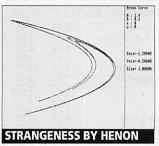
Where, in this case, A=1.4 and B=0.3 and x' and y' are



new values for x and y. This system is called a 'strange attractor'. Plotting a number of points iteratively starting from certain initial values produces a map. However, for certain initial values of x and y it tends to infinity (and the program produces an error). This was proved by Henon.

The system is an 'attractor' because all nearby points converge to it. It is called 'strange' because the object is not a simple shape like a point or a cycle of points but is fractal in nature. The exact structure of the map is not understood, even today.

Henon works on all Acorn machines and allows the user to investigate the map. You can also vary the initial starting values to verify that the same map (or an error) is produced for all values. The program also allows the constants A and B to be altered which will produce similar, but different curves.



When run, the program will prompt you for values for A, B, x and y. Sensible defaults are shown and will be used if you simply press RETURN. The map will then be plotted. If the given values tend to infinity, the computer will beep and you'll be prompted for some different values. If the values are valid, 10,000 points will be plotted. This may take some time, especially on eight-bit machines, so you can press Q to abort the process.

At this point, an outline box will appear on the screen. This can be moved with the cursor keys and allows you to zoom into the curve. Its size can be varied with < and >. To plot the selected area press SPACE. Alternatively, Arc owners may use the mouse to move the zoom area. The right button reduces the area, the left button increases it and the middle button starts the plot. On either machine, R resets the screen to 'full zoom'.

Pressing ESC at any point will allow you to enter new values for the initial parameters, while CTRL-ESC quits.

Thanks, Gareth. Now we all know how it's done, perhaps we'll see some machine code versions with real-time panning and zooming or maybe a touch of colour?

#### **CRASH COURSE**

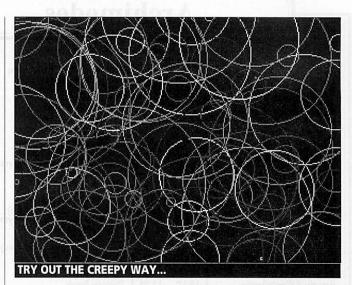
Here's a trio of, how shall we say, 'features' in Risc B OS. The first and 'best' has been pointed out by C Dean Murphy of Dublin. First, make sure all your A data has been saved from the desktop (this feature is 200 quite lethal!). Now pop up a menu, point to its title bar, hold down Select, take a deep breath and press ESC.

This normally causes address exceptions or abort on data transfers. If you're lucky it bombs out the 'owner' of menu! Repeated use is likely to upset the filer, the palette and even the switcher. I've even seen it knock out the icon bar completely.

Moving rapidly on... Certain versions of Edit (such as 0.64) can be crashed completely by loading them up and pressing F9 (Redo). I would guess that this is caused by Edit trying to redo nothing, as 'nothing' has yet to be done!

Finally, the \*DeskTop command can take an optional -File parameter. This can be followed by a list of \*commands to be passed to Wimp\_StartTask. This is very handy for autostarting commonly used applications. Personally, I run my Arm3 'kicker', visit my System and Fonts directories (so applications know where to find modules and the like) and load the desktop utility Menon.

This system worked fine until I installed a SCSI drive in addition to my internal ADFS hard disc. If the SCSI filing system had been selected with \*SCSI, I was getting errors from applications claiming they couldn't find system modules or outline fonts. Close investigation of the system variables



revealed that the System\$Path and Font\$Prefix variables did not contain 'adfs:' filing system prefixes or even my internal disc name (merely a solitary ':4'). It seems that \*commands passed to Wimp\_StartTask don't quite get the full treatment they deserve!

I've come up with a rather horrible patch to get round this problem, but I would be very interested (and relieved) to hear if anyone has a realistic solution before printing this rather hideous bodge.

## **PRIZE £20**★

#### **CREEPSHOW**

B It never ceases to amaze me what people will do with a mode 13 screen. The afore mentioned Dean Murphy has sent in a little ditty called Creepy. It takes any mode 13 screen and makes the pixels creep randomly about the screen. You must have at least 160K screen memory configured first. A demo picture is generated by DEF PROCpicture. If you have some of your own, or indeed, someone else's, artwork, merely replace the PROCpicture by a \*ScreenLoad.

Dean says if you have an Arm3, the A%=250 can be replaced by A%=1600. This is the number of dots that are 'creeped' per frame. For screens with areas of black, a different effect can be achieved by removing the \'s from the two lines before .pickd. This prevents black



pixels from creeping and tends to merge areas of colours.

One technical point about Dean's program; random numbers are generated by a macro call taking the number of bits to generate as a parameter, ensuring random numbers are produced in the shortest time.

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#### HUBBLE BUBBLE

This program was written by James Wilkinson and it is in reply to our request for 'natural' programs. It C uses multi-screen animation and allows you to a generate bubbles for all occasions. Bubble size is controlled by the three mouse buttons; the middle giving constantly large bubbles, the left providing bubbles which gradually reduce in size and the right producing small bubbles which grow in front of your very eyes! Further variety can be yours by using keys 1-5 to set bubble type. 1 gives transparent bubbles. 2 provides solid white bubbles, 3 an opaque version of 1. 4 gives you solid white with a black border and 5 produces a dithered grey

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bubble complete with white edging. Once the bubbles have been selected they will follow the mouse pointer producing a seemingly infinite stream. So on a hot summer day you can load the program, then lie back and pretend that you're watching a Perrier advert.

### PRIZE £10★

#### CAN'T SEE THE WOOD

B In the August issue we carried a program by B Barry Wicket that drew trees. This feature inspired Paul McKenzie into action (again) and he sent us no less than three arboreal listings. The best of these, Tree2, earns him a tenner. It is a pretty standard recursive tree. However, it does plot thick branches (in 'brown' if you have a Master, an Archimedes or a Beeb with GXR) and it does perform a second pass and add a smattering of leaves. Although there is no randomness within the body of the program, the tree it draws has a very skeletal and non-uniform appearance to it.

The number and nature of branches can be easily changed by altering the parameters in the three recursive calls to PROCt.

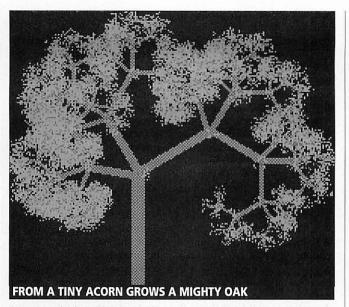
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#### **GETTING ROPED IN**

Welcome, ladies and gen-

tlemen, to that part of \*Info known as One Line Corner. OLC may be small, but it is perfectly **E** formed, and this month is no exception. We have two programming epics this month. The first was written by Michael Fairbank, is Archimedes only and entitled Rope. Unfortunately, either Michael forgot to supply his address or our cat has managed to hide it somewhere. So if the real Mr Fairbank can let us know his whereabouts, we can send him some cash!

Michael's program is yet another variation on the String Thing, but includes the effects of gravity. Arm3 owners may like to change the number of



'segments' that make up the rope from 10 to 20 contained in variable N. Apart from the rather bizarre first couple of seconds, it produces a strikingly realistic rope attached to the pointer - even better than those in Jet Set Willy...

## ■★PRIZE £10★■

#### UNKNOWN PLEASURES

**B** Our second one-liner, JDUP, comes from \*Info B regular Garry Quested. It will work on all machines, but eight-bit users will have to type in each statement separately and join them all together with last month's ToOneLine listing. You'll also have to wait about half an hour for the program to run. Can anyone think of an easy way to speed it up?

Joy Division fans may see a resemblance between the program's output and the band's Unknown Pleasures LP.

If you want to fiddle with the program, the variable L controls the number of lines drawn across the screen and P sets the number of sinusoidal peaks on each line. The C, W and H arrays contain the centre, width and height of each of these peaks. Varying these will alter the apparent 'rockiness' of the final picture.

Perhaps we could start a sub-division of OLC devoted just to album covers! As always, £10 will go to the author of any good ones.

#### **GREEN PROGRAMS**

Many moons ago, a utility was published in BAU that allowed listings and the like to be printed out sev**c** eral columns to the page. **E** Looking back, we thought h the original could do with a new feature or two so we now present a new module called ListAid that should cater for most users' needs.

Often, particularly when writing in assembly language, listing your program out can waste a great deal of paper (more than a rainforest or two when you add up all the output of the BAU readership). Aside from any altruistic environmental reasons for listing in several columns there is also the practical side effect that your program will be easier to read when it isn't spread out in a long, thin dribble of ink over umpteen pages.

ListAid is a relocatable module that supports several \* commands. Simply enter and run LASrc and the module ListAid will be saved in your current library. To use ListAid either load it by typing \*ListAid or run a previously saved parameter file (more on this later). Once installed, you may used the \*Listing command to print out your program.

The original multi-column lister assumed you wanted to print your listing out, but this excluded the possibility of loading the multi-column version into a text editor (like Edit

or Pipedream). Since it is easy to redirect screen output to a file or a printer, ListAid simply prints the formatted text on the screen and leaves it up to you to decide where it goes! Risc OS permits the destination to be a file or the printer.

ListAid's default settings specify a three-column listing across an 80-character wide page. You can alter any of the parameters that determine the format of ListAid's output details are given later on. However, to see how ListAid is used, try out the default format with a listing of your own. The procedure is as follows:

Turn your program into a text file. For Basic programs type:

LISTO 1 (or similar)

\*Spool Temp

LIST

\*Spool

to generate a text file called Temp, or use a utility like Philip Colmer's BasTxt to do the conversion.

- Optionally, type \*Listing Temp to display the multi-column listing on the screen. Your screen mode may not be wide enough to accomodate the output - change it as necessary.
- Print out the file by simply using the Risc OS file redirection convention, by adding { > printer: } to the end of the command. Alternatively, send the output to a text file by adding { > TextFile } and load it into Edit or similar. Then print this out in the usual way.

Generally speaking, unless you want to use a fancy font or have sophisticated headers and footers, ListAid should provide enough facilities for listing directly to the printer, which is the idea - it is a programmer's tool and shouldn't necessitate undue switching to and from the desktop.

To alter the format of the ListAid output use the command \*ListSet to fix the value of one or more parameters. To see the current values type \*ListPars. Most of the parameters have numerical values although a couple are of the YES/NO type. Here is a summary of what they all mean.

• Columns: the number of text columns displayed. If you set just this, the current page width is split equally between the number of columns you specify. The gap between columns is taken into account.

- Width: the width of the printed page. Typically, a standard dot matrix printer will be able to display 80 or so characters in a normal font and perhaps 110 or more using a condensed or smaller one. Obviously, wide body printers, like the Star LC-15 on which this module was tested, can support more columns − 120 or more in a normal font and maybe 230 or so condensed!
- Length: the number of lines of listing actually printed per sheet. Add this to the various margins (see below) to find the true paper size.
- ColumnsSize: the width of a printed column. If this is specified rather than width then the page width is calculated accordingly. Generally you'll specify one or the other.
- TopMargin, HeaderMargin, FooterMargin and BottomMargin: the vertical margins that surround the header and footer lines above

and below the main listing. If you have specified page ejects at the end of each page (see Eject below) then the footer margin is a bit redundant.

- Gutter: the gap in characters between columns.
- Eject: this should be followed with Y or N rather than a number. If it is Y then a page eject (Ascii 12) is printed after each page. Otherwise the bottom margin is physically printed. In this case you must ensure that the total page length (Length plus the four margins) is correct.
- Balance: another Y or N option. When it is N the last page, if not entirely full, will be filled up from left to right in the usual way. When it is Y the columns will be 'balanced' so they are of even length, as far as this is possible.
- LeftMargin: the number of spaces printed to the left of each output line. (Normally this should be zero and you should arrange the paper in the printer correctly!)

So, a typical \*ListSet command might look like this:

\*ListSet -width 120 -columns 2 -gutter 4 -eject Y. On typing \*ListPars, you will see not only the parameters described above but three other strings (empty by default) - Setup, Header and Footer. These can be set in similar ways using the \*ListSetup, \*ListHeader and \*ListFooter commands. The setup string will generally contain characters that should be sent to a printer to select the correct font, or whatever, for printing. You can include control codes if you like - they are given as decimal (or hex) numbers. Real characters should be put in quotation marks to avoid confusion. For example, \*ListSetup 15 is used to put Epson printers in condensed mode. Another valid sequence might be: \*ListSetup 64 27 "E".

Check your own printer manual to find out what font styles and size are available and experiment to find the right balance between number of columns and readability.

There are two other userdefinable strings, like the setup string – the header and footer. These are displayed centrally at the top and bottom of each page respectively. Special codes may be introduced into these strings:

%0 current page number

%1 current time

%2 current date

So typical definitions might be:

\*ListHeader "Page:

\*ListFooter "MyProg

%1 / %2"

Finally, you may save the current parameters, headers and footers as a file using the \*ListSave command. This creates an Obey file which may be run without *ListAid* being loaded. The first command in the file is a \*RMEnsure which attempts to load the *ListAid* module (it will normally be found in the library). Then follows a series of commands which define the parameters in the usual way. If you like, try editing a saved file in *Edit*.

*ListAid* is a relocatable module and so its structure is similar to many other modules.

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Creator is a complete easy-to-use arcade game designer that runs in the Desktop on the Archimedes and A3000 to bring professional games techniques to everyone. You can design arcade adventures, change screens when you want or create scrolling shoot-emups - the choice is yours. Supplied on two discs, including the designer, run-time system, sampled sounds, tunes, sprite library and demonstration games and comes with a 50 page User Guide.

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Alpine Software, Dept BAU1, PO Box 25, Portadown, CRAIGAVON, BT63 5UT

At the start is a set of offsets to key areas of code. Routine .init is called when the module is loaded or reinitialised and this routine claims memory from the RMA in which to store the parameters, header and footer strings and as workspace. Routine .quit releases this memory when the module is killed. The only other important offset is la\_commands which is a table of \*commands supported.

For simplicity a macro is used to define each command in the null-terminated list. FNcommand takes the command name and the minimum and maximum number of parameters allowed for it. It is assumed that for each command three labels will exist. For example, for \*Listing there is .Listing which is the routine itself, .Listing\_Help which is the help string and .Listing\_Syntax which is a syntax string (should you provide the wrong number of parameters for example). A point of interest is that a 'token' is used for Syntax: \*keyword - a feature of Risc OS that saves on memory.

The \*ListSet command uses the wonderful OS\_ReadArgs call we described in August. It simply looks for known parameters (supplied in a string) and extracts the individual values you supply. Any value you give is checked against the minimum and maximum allowable figures for that parameter (held in .minima and .maxima) and an error returned if it falls outside these. For simplicity, 254 is defined as FALSE and 255 as TRUE. In this way, Yes/No type parameters (like -Balance) can be dealt with as well as numeric ones.

The actual printing process is quite simple. Characters are fetched one at a time from the given file and sent to .write\_char. This stores them in a large buffer for .show\_page to print out when the page is ready. The page is treated as a long thin sheet one column wide. So, a four-column 60-line page is actually stored as 240 lines in memory. Once a page is full, or there is no more to display, each real line is output by printing the left margin and

then fetching each column and and printing it separated by the correct gutter.

Which columns are fetched may depend on whether the Balance option is used — a (slow but simple) divide routine calculates where to split text. The special codes %0 to %2 that may be included in headers and footers are decoded with another handy SWI call. The page number, time and date are converted into strings are passed to OS\_SubstituteArgs so it can swap the % codes for the real thing.

You may like to add enhancements to *ListAid*. First, build up a library of useful parameter sets. A nice small listing font can be produced on my Epson LQ500 printer with: \*ListSetup 27 "g" 27 "A" 6.

Next, you might like to alter the header time and date formats. These are stored in the string at .time\_format. If you want to add new codes (%3 onwards), the appropriate code to supply the strings to be substituted should be added to the .head\_foot routine.

#### \*OUIT

As usual, it's over to you again. If you've written any programs or routines, small or large, you feel may be of interest to others, do send it in. A brief description of your program and a stamped addressed envelope will ensure you get a speedy reply.

Next month, a rather wacky wavy line from Jan Vlietinck, a speedy sprite rotator from Barry Wicket and, well, maybe something from you!

David Lawrence Dave Acton

#### **SUBMISSIONS**

Please send your submissions to us at: \*Info, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. All but the shortest of programs should be on disc and accompanied by a brief description of their purpose and operation. A stamped addressed envelope with your submission will ensure the return of your disc.

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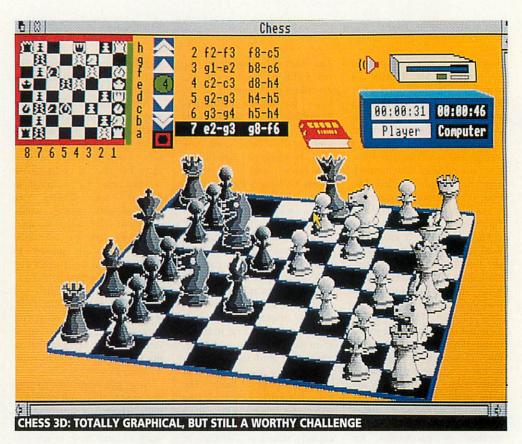


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Games are often seen as a diversion from the serious task of education. **CHRIS DRAGE** says that there is often a hard core of learning inside the soft shell



# **GAMES CHILDREN**

he computer is a powerful vehicle, forming an integral part of a child's range of learning experiences. Used in conjunction with other media a great deal of thinking and discussion is encouraged. The exchange of ideas often results in children learning from each other and not just from the adults in their lives.

The end product may or may not be the game itself; the key educational element in games is problem solving. Children in play are in fact practising problem-solving strategies in a 'fun' situation. Such computer activity offers children the opportunity to work in many areas so important for today's youngsters and to which more time must be given.

#### SIMULATING IT

Dressing up problem-solving in a simulation or an adventure format has always been a very popular computer-based activity. A successful simulation causes the user to say 'I see what happens' or 'I know how we can deal with this situation' in response to the program demanding your reaction or involvement. In a computer simulation, a child may be required to take decisions of life or death, fight or flight that they will not usually encounter in everyday life.

Computer-based adventure programs can also generate a creative and imaginary world in the classroom. Experimentation with ideas, discus-

sion, formulation and sharing of strategies, drama and simulation all feature largely in adventure programs. Traditional drills-and-skills have no place in the micro-world generated by the computer. The emphasis is on children actively participating in an exciting and stimulating environment.

Among my choice of simulation games, flight simulators take first place, perhaps due to the fact that I desperately wanted to train for a pilot's licence in my youth. Flight simulators on the Archimedes are very good indeed. Chocks Away with its extra mission supplement has to be the pièce de resistance with its multiple viewpoints and the optional serial link by which two 'pilots' can share the missions - creating a situation which really demands co-operation and shared strategies.

A tip here - if you can afford it, a joystick interface is a must for this game as it permits dual joystick control for both players and helps to preserve the keyboard. The interface and Risc OS-compliant software allow joysticks to be used on many of the games mentioned here. Of the two other flight simulators Interdictor 2 and MiG-29 both represent modern fighter aircraft. Undoubtedly, the latter is the better of the two with its multiple camera viewpoints, its variety and realism. It is highly enjoyable and thoroughly recommended.

For motor racing enthusiasts Saloon Cars, a driving simulation, will not disappoint. Working your way up from training on and racing with an Astra GTE at Brands Hatch, the program employs excellent animation, graphic and sound capabilities, reproducing quite accurately the forces acting on a vehicle at speed with the added bonus of being able to fine tune the vehicle. Without doubt Saloon Cars is the most realistic driving simulation to date.

Golf, with its estimation of distances, speed and strength of swing and variables like wind speed and so on is a sport which lends itself to simulation. Unfortunately, all Archimedes' golf simulations assume women play no part in the sport! Of the three totally male-dominated simulations, my vote goes to Superior Golf, its construction set and Microdrive. The former program lacks the realism of the latter but makes up for it by allowing you to design individual holes or complete courses.

This feature is so accurate that one reader, an enthusiastic golfer at Morecambe GC, has recreated the course on screen to find that it plays just like the real thing! The program has actually helped in testing out proposed alterations to the Morecambe course. As a golfer myself, I must confess I like the 3D graphics, the realistic swing control and the behaviour of the ball in *Microdrive*, a program that lacks only two things: a variety of courses and Superior Golf's design element. Both programs are highly recommended.

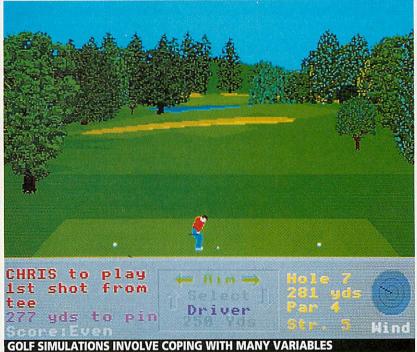
Other sporting simulations worthy of a look are 4D's The Olympics (very topical every four years or so), Break 147 (a pool simulator that's great for angles, trajectories and so on) and Krysalis' Manchester United (managing a football team for a season).

#### STRATEGY GAMES

With computer strategy games children quickly discover the value of keeping records of their strategies and moves on paper when tackling the tasks. Games like chess and Othello (Reversi) and so on offer children one particular advantage: as the opponent is a very patient nonhuman, a group of children can quite happily challenge it. It is because these games promote group problem-solving situations that the computer versions are so useful.

Examples of computerised board games abound; perhaps none more so than chess. Chess, by David Pilling, is a must for anyone interested in a full-featured computer version of the game. Costing only £5.99, this represents excellent value for money. With about the same playing ability but with a totally graphical approach, Micropower's Chess 3D permits the board to be rotated and seen from any one of four angles. A corresponding 2D view is always available - useful for beginners. Young club players of high ability will find either of these programs worthy challenges.





Another board game of note is Trivial Pursuit, an on-screen version of the real thing in which six players can compete. The problem of getting six hands on the mouse is neatly overcome by the addition of a Voltmace Deltacat joystick, a mouse substitute, which can be handed directly from one player to another. Another interesting blend of quiz game and strategy is employed by Master Break, an all-action, snooker-based, general knowledge quiz whose only serious shortcoming is its inability to include children's own datafiles of questions.

Repton 3 is an on-screen strategy program which children from seven years upwards simply adore. The traditional Repton graphics are

# The swite

All 4Mation packages for the Archimedes carry a FREE SITE LICENCE.

sm#ret

SmArt is a Linked Graphics System. When picture files are loaded into smArt, different parts of the picture can be changed by

making selections from a menu. The graphics components are automatically scaled so that the parts always fit. Pictures may be saved as Draw files or transferred to DTP programs or any other applications which can handle Draw files.

The smArt package comes with over two dozen files on subjects ranging from shops to cars, and churches to British Isles maps. Available as separate products are discs of smArt files on specific themes such as Leisure, Heraldry, Faces, Fashion, Homes, Trees & Gardens, and Dinosaurs.

smArt £55 (NZ\$ 198) smArt discs £16 (NZ\$ 59)



For those wishing to create their own smArt files, smArtFiler is an application which compiles smArt files from your source Draw

files. Full instructions are provided along with lots of examples. Individual components may be scaled, rotated, and placed in front of or behind other components. Menu entries may be specified.

If it can be drawn it can be a smArt file.

smArtFiler £35 (NZ\$ 129)



Chameleon is an ideal companion to smArt, and a must for anyone who needs to make quick and easy colour changes to

Draw files. As well as palettes for 16 and 256 colour modes, there are options for 256 shades of grey and a RGB colour cube which provides thousands of colours. Colours may be selected from other Draw files so can be copied from one picture to another. Colours may also be changed in HSV values; Hue, Saturation and Value. Edited files may be saved as normal Draw files or as colour separations. A clever Undo and Redo facility allows virtually any number of colour changes to be cancelled and then reinstated. Zoom and Magnification facilities allow accurate editing of small areas.

Chameleon £25 (NZ\$ 95)

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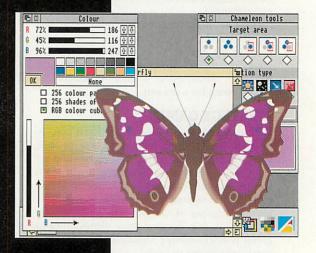
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RAM: 5

Gol Go

Save as:

Goblin OK

|Goblin

5 Goblin



A 🖥 📆 📆 🔀

now upgraded and much better than in any previous incarnation. No library of games software is complete without Repton 3 – it is a must.

Another of my favourites is Square Route, an uncomplicated block-fitting game not unlike Tetris, which is simple to play but very difficult to master. The game is based on a grid onto which you must place a certain number of differently shaped pieces within a time limit. It sounds quite easy, but ...

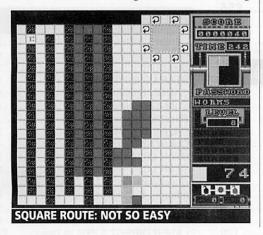
Remember, if your budget is too tight to permit any of the above games, there are some good yet cheap strategy games in the public domain. It is worth sending for a demo disc and catalogue from some of the PD dealers advertising at the back of this mag.

In my opinion there are two Archimedes adventures which outshine all previous BBC B or Archimedes programs of this type. The first, The Wimp Game, is a real brain-teaser for older children (and adults). It is a pointer-based adventure in which no text is used and objects and their behaviour must be investigated by simply pointing and clicking on them. One rather slick difference is that you can 'pick up' a magnifying glass to observe objects more closely. There is no time limit, no help nor any numeric score in this program, you simply advance from being the owner of a humble Acorn Atom, to finally getting your hands on an R200 Unix workstation.

The second adventure program, Wonderland, will be difficult for other publishers to eclipse. Even the central character is a girl, Alice, and that is unique in itself. Based on the Reverend Dodgson's children's classic, this huge adventure - it is contained on four discs - is not for young children.

Wonderland uses its own Wimp system (not unlike a Mac's), which possesses some excellent features, like presenting only those verbs pertinent to the particular object encountered and an ability to map the adventure on to the screen as you go along - no more scribbling on scraps of paper. Once the map contains several locations you can click on their icons in order to move your viewpoint there.

A graphics screen can be called up from almost any location, some of which contain the most delightful animations imaginable. The scene depicting a piano play by itself and a nearby chair dancing in unison had my seven year old in stitches. Unfortunately, there is no sound available in the game. However, being





able to drag objects about and place them in windows more than compensates as it keeps the typing down to a minimum. I consider this adventure an absolute must.

#### DESIGNING YOUR OWN

Why purchase a game when you can design and make one yourself? Ideally, with children this could be done with Logo but there are other means available. Creator: Arcade Games Designer is an unfortunate title, as this program enables a number of different games (or animated sequences) to be created from scratch with little or no programming knowledge. It then permits these to be run independently of the creator program itself. Like all design scenarios, it is the planning before execution which is the key to success and is certainly the key educational element in this program.

With little or no typing, each component is built up in turn and can have different levels added (represented by different sprites) and sound effects and music. This is a very versatile little program which contains a number of good features (for example, gravitational effects, and stereo positioning of sounds) and it is worth sending for the demonstration disc in order to get a flavour of how it all works. Look out also for Adventure Language Programming System (ALPS), for writing text and graphics adventures, from the same stable.

The role of play in computer software is vital in helping to ensure that children will be making decisions and solving problems as well as discovering and practising fundamental thinking skills. The more that these thinking skills are practised in many different simulated situations, the more likely it is that they will be remembered and consciously used in real life. This is perhaps the most significant contribution to children's education that playing computer games can make.

#### PRODUCT DETAILS

- Chocks Away, Saloon Cars: £24.95 each from Fourth Dimension Ltd, 1 Percy Street, Sheffield S3 8AU
- Extra Missions, The Wimp Game: £19.95 each from Fourth Dimension
- Compendium: £39.95 from Fourth Dimension
- MiG-29 Fulcrums: £40.85 from Domark Software Ltd, 51-57 Lacy Road, Putney, London **SW15 1PR**
- Trivial Pursuit: £29.95 from Domark Software
- Joystick interface: £23.95 from The Serial Port, Burcott Manor, Wells, Somerset BA5 1NH
- Square Route: £38.95 from Computer Eyes, 16 Starnes Court, Union Street, Maidstone, Kent **ME14 1EB**
- Chess: £5.99 from David Pilling Software, P.O. Box 22, Thornton Cleveleys, Blackpool FY5 1LR
- Chess 3D: £19.95 from Micropower, Northwood House, North Street, Leeds LS7 2AA
- Superior Golf & Construction Set, Master Break, Repton 3: £19.95 each from Superior Software, P.O. Box 6, Brigg, South Humberside DN20 9NH
- Wonderland: £34.95 from Virgin Mastertronic Ltd, 16 Portland Road, London W11 4LA
- Creator, ALPS: £38.95 from Alpine Software, PO Box 25, Portadown, Craigavon BT63 5UT





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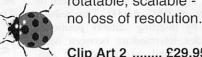
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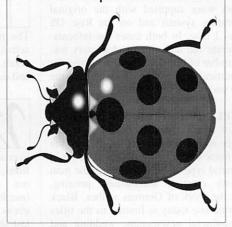
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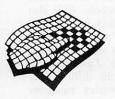
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**FONTS** 

ANTI-ALIASING Aliasing means the 'stepping' of a straight line when shown on a computer screen. Antialiasing is done by the software algorithm used for displaying fonts on the screen on an Archimedes or BBC A3000. This reduces jagged edges by inserting suitably positioned pixels in shades intermediate between background and foreground colours. Sets of antialiased fonts were supplied with the original Arthur operating system and on the Risc OS Applications 1 disc. In both cases the information to generate the anti-aliased characters was held in a number of bitmaps. But if a bitmap for a font of particular size was not available, the nearest size was scaled up or down.

**BLACK LETTER** This is the name of type set in a Germanic style and is is also called gothic. It was the name of the first typeface to be set in moveable metal type. John Guttenburg, the man credited with creating mechanised printing, based it on the work of German scribes. Black letter or gothic use today is limited to the titles of some provincial newspapers, wedding and funeral announcements, some legal documents and signs in ye olde English tea shoppes.

CHARACTER SET All fonts with the exception of symbol fonts contain letters, numbers, some symbols and punctuation. There are different character sets for Latin and Greek. For Arc/ A3000 users, The Electronic Font Foundry offers the only exceptions to the standard Latin 1 Character Set, including Cyrillic and Greek.

DECORATIVE Any style that cannot be easily be categorised is usually defined as decorative. It is the name used to cover unusual typefaces. 4Mation's Poster contains a good collection with letters made from twigs and type suitable for horror messages. This collection also includes a range of chunky, streaked and tube type. Decorative fonts also include artistic faces like Art Nouveau and Broadway.

EM and EN Standard measurements, usually used for spaces. Originally the notional size of a capital M, an em has come to mean 12 points and is irrespective of typeface or size. An en is half an em - six points.

FOUNT, FONT or FACES There is much confusion over these. Fount (UK) and Font (USA) - we mostly plump for the US spelling - means the printing of the total characters in a complete typeface, capitals, lower case, figures and punctuation, of a specified size and style. So 12pt Times Bold is a font name. Face is independent of size and style, so the face is Times. Having said that, today the two terms have become almost synonymous, taking either meaning.

There are hundreds of fonts, many available to Archimedes users. Some of the common ones are Avant Garde, Bookman, Courier, Garamond, Helvetica, Palatino, Poster, Times and Tiffany.

GARAMOND A well-known and very readable serif typeface, popularised by The Guardian (it is used, italicised, in the title). BAU used to be printed in Garamond, but it now comes out in Times (Trinity to Arc users).

HINTING is a method that the Outline Font Manager on the Arc uses to make the appearance of fonts better than they would normally be. The manager picks an alternative pixel to the actual one selected to give a more pleasing end result. Hinting is particularly relevant to serif and decorative faces.

ITALIC Any letter or face that slopes to the right is said to be italic, except for those inconvenient sans serif fonts said to be oblique. Often over-used, italics denote titles such as those of films, plays, books and so on, foreign phrases not completely assimilated into English, (mazkirovka takes italics, glasnost doesn't) stress or emphasis, particularly in speech. The last should be discouraged and almost all other uses in copy are spurious.

JOINED-UP Well, really the entry is Cursive, but C was already used up, so... Cursive describes a range of types that copies the 'joined-up' style of handwriting. The range is wide, from elegantly formal copperplate to those letters that resemble graffiti or felt-tip letters scribbled in haste. Chance is a excellent medium italic script based on Zapf Chancery, while FineScript is pure copperplate.

KERNING Some letters fit well against each other and some fit poorly. Especially in large text sizes, a W followed by an A can look ungainly. The reduction of spacing between specific letter pairs is known as kerning. Better DTP systems use fonts with built-in tables specifying the space between special pairs of letters, others just offer manual kerning which means inserting kerning codes between letters.

TITIE LEADING is the term used to describe the vertical spacing between the lines of text. The term arises from the strips of lead used to separate the horizontal strips of type in original hot metal printing.

MATHEMATICAL SYMBOLS Although most fonts contain basic mathematical symbols, this is not sufficient for some people's needs. Both Computer Concepts and EFF publish a MathGreek font with a selection of Greek letters and various mathematical symbols. EFF also publishes a MathLogic font which just contains logic symbols. Anyone who really wishes to include equations in their text should consider the use of Computer Concepts' Equasor package, which makes much of the difficult and tedious work of creating complex equations completely automatic.

**DOUTLINING** This is now the standard for Acorn fonts. It is recognised as the most advanced system for holding font information. Outline fonts are created mathematically, each typeface being composed of a series of numbers which mathematically describe the construction of the font. Being generated in this way, the font is resolution-independent. To use outline fonts on an Archimedes you must have Acorn's Outline Font Manager but if you purchased a DTP package you will already have it.

POINT SIZE The point size is often described as the distance between the ascent line and the descent line - the distance between the top of an 'h' and the bottom of a 'y'. The point size was originally the distance between the rows of leading (qv) in the days of mechanical type. In DTP it is the height of an imaginary bounding box around all the characters in a font.

QUOIN Pronounced 'koyn', this term dates from the old hot metal type days, before the advent of DTP, and refers to a wedge, hammered in with a yammerluff, used to lock the type in place in its tray.

ROMAN is another word for the older serif typefaces, in which the letters are made up of thick and thin strokes. The first Roman typefaces were similar in form to the inscriptions on the Trajan column in Rome, which dates from 114 AD. Modern Roman faces first appeared in Venice in the late 1400s and are based on the handwriting of Italian scribes.

Over the centuries serif style has moved away from a style similar to handwriting, with slanted serifs, to a style closer to engraving, with vertical serifs. Even today, Roman is often referred to as old face or old style and is best exemplified by the type called Garamond. Modern serif typefaces start with Times, and move on to such modern variants as Palatino (designed by Zapf).

SERIFS The 'twiddly' bits you can see on the letters of roman fonts. A sans serif face has no serifs. These faces made their appearance in Victorian times, when they seemed symbolic of the machine age with their suggestion of force. Sans serif letters are usually of the same thickness throughout. Their use is usually restricted to display types - that is for headlines in a magazine or on a poster - as they can be tiring to read when used for long articles or books. The most well-known sans serif font has to be Helvetica - Homerton on the Archimedes.

Slab serif type is made up of much thicker strokes than roman or serif type. The serifs are thick and square rather than curved (see the headline for this article). Such fonts, which were popular in the late 19th century, were also known as Egyptian or Mechanistic. They are close in feeling to sans serif typefaces.

TYPEFACE Type can be divided into various groupings. In each group there are different typefaces. Those used in printing can be divided into roughly six kinds, although the British Standards Institute defines more, with nearly a dozen different groupings.

The four main divisions are - Black letter or Gothic, Roman or Serif, Slab Serif, and San Serif. There are two other divisions of lesser importance - Cursive and Decorative.

ULTRA An exaggerated heavy weight of a particular typeface. Two common Archimedes outline fonts with this weight are Europe and Warsaw. Ultra works best in display lettering

and banner headlines.



VERSAL An ornamented letter at the start of a chapter or section. One of the oldest terms in use, it predates of the oldest terms in use, it predates moveable type and originates from

the medieval monastic world of illuminated manuscripts and quill pens.

WEIGHT Each typeface has one or more members differing in weight. Electronic Font Foundry, the largest Archimedes font supplier, recognises nine: extra light, light, book, medium, demibold, bold, extra-bold, ultra-bold and black.

Most of the DTP packages for the Archimedes recognise only three weights - light, normal and bold - so EFF splits fonts with larger families into two, to simplify their installation and use. French, for example, consists of French light, French medium and French bold, while French2 contains French book and French demi-bold.

X-HEIGHT This is the generalised height of lower-case letters in a font. The height of the letter 'x' is usually typical of this height, therefore the term x-height is used. This should not be confused with point size.

YAMMER An old term that has found its way into DTP - a yammerluff was a leather-covered mallet used to hammer home a quoin. Hence text that is badly leaded or kerned is said to be 'yammered'.



ZAPF Herman Zapf is a modern font designer who has given his name to several typefaces, such as Zapf Chancery. Zapf Dingbats is a

collection of blobs and symbols that has many uses. It is called Selwyn on the Archimedes.

Typefaces and fonts can be a minefield of related jargon.

**DAVE FUTCHER** throws some light on the subject with a jargon busting alphabet

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A new map will appear in next month's Acorn User to show how to find us. We have, in fact, only moved approximately ¾ of a mile.

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| £454.00°          | £533.45  |
| £149.00°          | £175.08  |
| £369.00*          | £433.58  |
| £649.00           | £762.57  |
| £349.00           | £410.08  |
| £239.00*          | £280.83  |
| £219.00*          | £257.33  |
|                   | £239.00°<br>£349.00<br>£649.00°<br>£369.00°<br>£149.00°<br>£454.00°<br>£205.00°<br>£169.00°<br>£65.00°<br>£79.00°<br>£27.00° |

Archimedes 540 Only

4Mb RAM Upgrade (Upto 16Mb) £479.00 £562.83

Sony Bulk

£10.00

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|---|--------|---|-----|-----|-----|
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Description

|                                    |               | 0       |
|------------------------------------|---------------|---------|
| Orion 1 Mb RAM Upgrade             | £55.00        | £64.63  |
| (Expandable to 4Mb using of        | only 8 chips) |         |
| Orion 3 Mb RAM Upgrade             | £156.00       | £183.30 |
| Serial Upgrade                     | £18.00        | £21.15  |
| Acorn User Port/Midi Card          | £46.00        | £54.05  |
| Acorn Monitor Stand                | £27.00        | £31.73  |
| PRES Monitor Stand                 | £24.95        | £29.32  |
| PRES System Housing                | £69.50        | £81.66  |
| HCCS 45Mb HardCard                 | £339.00       | £398.32 |
| CC Scanlight Junior A3000          | £174.00       | £204.45 |
| CC Scanlight A4 Mk II A3000        | £369.00       | £433.58 |
| CC Sheetfeeder for A4 Scanner      | £149.00       | £175.08 |
| CC Scanlight A4 + Sheetfeeder      | £454.00       | £533.45 |
| CC Scanlight 256                   | £205.00       | £240.88 |
| RTFM Joystick Interface + S/W Disk | £34.95        | £41.07  |
| Serial Port Joystick Interface     | £22.95        | £26.97  |
| Voltmace DeltaCat Joystick         | £26.00        | £30.55  |
| Lingenuity SCSI Controller Card    | £149.00       | £175.08 |
| Orion TV Modulator + Audio         | £65.00        | £76.38  |

## Books

|                               | 1111   |        |
|-------------------------------|--------|--------|
| Programmers Reference Manuals | £77.00 | £77.00 |
| BASIC V Guide                 | £19.45 | £19.45 |
| A3000 Technical Guide         | £28.95 | £28.95 |
| A540 Technical Guide          | £65.00 | £65.00 |
| Basic V: A Dabhand Guide      | £9.95  | £9.95  |
| Archimedes First Steps        | £9.95  | £9.95  |
| Archimedes Assembly Language  | £14.95 | £14.95 |
| Extra Manuals                 |        |        |
| Acorn D.T.P.                  | £10.00 | £10.00 |
| 1st Word Plus Release 2       | £10.00 | £10.00 |
| ANSI C Release 3              | £20.00 | £20.00 |
| ANSI C Release 4 (Desktop C)  | £25.00 | £25.00 |

£25.00 £45.00 £106.25 £200.00 £375.00 £29.38 £52.88 £123.84 £235.00 £440.63

£25.00

£25.00

Acorn Assembler Rel. 2 (Desktop Ass.)

## Orion Bulk Diskettes

£11.75

£12.50

All our disks come complete with labels etc. and are 100% certified error free. In the event that a disk fails it will be replaced immediately. Top row of prices ex. VAT. Bottom row of prices inc. VAT.



VIDC Enhancer (540 only)

|      |             | 25              | 50               | 100              | 250              | 500                | 1000               |
|------|-------------|-----------------|------------------|------------------|------------------|--------------------|--------------------|
| 51/4 | DS/DD 96tpi |                 |                  |                  |                  | £115.00<br>£135.13 |                    |
| 21/2 | MF/2DD 1Meg | £9.75<br>£11.46 | £19.50<br>£22.91 | £34.00<br>£39.95 | £77.50<br>£91.06 | £145.00<br>£170.38 | £270.00<br>£317.25 |

## Printers

C.C. Qume Laser Direct

Star LC24-200 Colour

#### PLEASE NOTE

L our printers are UK Models and NOT grey import Please take this into account when deciding where to purchase your printer.

| C.C. 600 DPI Expansion Card            | £309.00      | £363.08  |
|--|--------------|----------|
| Canon LBP4 Laser for above             | £659.00      | £774.33  |
| C.C. 600 DPI LBP8 Laser Direct         | £1319.00     | £1549.83 |
| (Free Impression II with Qume/LPI      | 38 Laser Dir | rect)    |
| Canon Bubblejet BJ10e (White or Black) | £219.00      | £257.32  |
| Citizen 120D+ (Parallel)               | £115.00      | £135.13  |
| Citizen 124D                           | £165.00      | £193.88  |
| Citizen Swift 9                        | £162.00      | £190.35  |
| Citizen Swift 24                       | £225.00      | £264.38  |
| Citizen Swift 24x                      | £329.00      | £386.58  |
| H.P. Deskjet 500                       | £339.00      | £398.32  |
| Star LC20                              | £130.00      | £152.75  |
| Star LC200 Colour                      | £175.00      | £205.63  |
| Star LC24-200 Mono                     | £205.00      | £240.88  |

# Ribbons (Branded)

| Amstrad DMP2000/3160               | £5.50  | £6.46   |
|------------------------------------|--------|---------|
| Canon BJ130 Bubblejet (BJI481)     | £10.00 | £11.75  |
| Canon BJ10e Bubblejet (BC01)       | £16.29 | £19.14  |
| Canon BJ300/330 Bubblejet (BJI642) | £12.00 | £14.10  |
| Citizen 120D                       | £3.25  | £3.82   |
| Citizen Swift 24 Black             | £3.95  | £4.64   |
| Citizen Swift 24 Colour            | £13.75 | £16.16  |
| Colourjet 132/Canon PJ1080 Black   | £9.25  | £10.86  |
| Colourjet 132/Canon PJ1080 Colour  | £14.75 | £17.33  |
| Epson LX80/86                      | £3.75  | £4.41   |
| Epson FX80,MX80,LX800              | £4.50  | £5.29   |
| Epson LQ400,550 Fabric             | £5.25  | £6.17   |
| Epson MX100,FX1000,FX1050          | £5.75  | £6.76   |
| Epson EX800/1000 Black             | £7.25  | £8.52   |
| HP Paintjet Black                  | £21.00 | £24.68  |
| HP Paintjet Colour                 | £26.00 | £30.55  |
| HP Deskjet + (Permanent Ink)       | £13.20 | £15.51  |
| Panasonic KXP145.KXP115            | £7.50  | £8.81   |
| Panasonic KXP140                   | £9.35  | £10.99  |
| Star LC10                          | £3.80  | €4.47   |
| Star LC10 4 Colour                 | £5.75  | £6.76   |
| Star LC200 Black                   | £5.00  | £5.88   |
| Star LC200 Colour                  | £9.75  | £11.46  |
| Star LC24/10 / LC24 200 Black      | €4.75  | £5.58   |
| Star LC24 200 Colour               | £11.50 | £13.51  |
| Canon LBP4 Toner Cartridge         | £55.00 | £64.62  |
| Canon LBP8 Toner Cartridge         | £62.00 | £72.85  |
| Qume Crystal Print Toner Set       | £67.00 | £78.73  |
| Oume Crystal Print Drum Set        | £89.00 | £104.58 |
|                                    |        |         |

## Ribbons (Comp.)

All of our compatible ribbons are high quality British brand. We do not sell "White Box" compatible ribbons.

| Brother M1009,M1109                  | £2.95 | £3.47 |
|--------------------------------------|-------|-------|
| Brother HR10,15,20,25,35 Fabric      | £3.25 | £3.82 |
| Brother HR10,15,20,25,35 Multistrike | £4.65 | £5.46 |
| Canon PW1080A                        | £3.85 | €4.52 |
| Citizen 120D/Swift 24                | £3.05 | £3.58 |
| Epson LX80,86                        | £2.25 | £2.64 |
| Epson FX80,MX80,LX800,LX850          | £2.95 | £3.47 |
| Epson LQ500,LQ800,LQ850              | £3.00 | £3.53 |
| Epson LQ1000,LQ1050,FX1000           | £3.50 | £4.11 |
| Epson LQ2500,LQ2550                  | £3.55 | €4.17 |
| Epson EX800                          | €4.45 | £5.23 |
| Panasonic KXP1081,1090,1080          | £3.65 | £4.29 |
| Panasonic KXP1124                    | £3.55 | €4.17 |
| Star LC10                            | £2.55 | £3.00 |
| Star LC10 4 Colour                   | £5.00 | £5.88 |
| Star LC24/10                         | £3.95 | £4.64 |
|                                      |       |       |

Please call for prices on any ribbons not listed here. We can supply almost any ribbon required and, dependent on quantity any colour.

Please Note - Quoting the KARMA Group Code speeds up our search for a ribbon compatible with your printer.

## Archimedes/A3000 Software

£859.00 £1009.33

£249.00 £292.58

| DTP                                 |         |         |         |
|-------------------------------------|---------|---------|---------|
| Impression II (CC)                  |         | £129.00 | £151.57 |
| Impression Junior (CC)              |         | £74.00  | £86.95  |
| Impression Business Supplement      | NEW     | £42.00  | £49.35  |
| EasiWriter (Icon Technology)        | NEW     | £134.00 | £157.45 |
| Desktop Folio (ESM)                 |         | £79.00  | £92.83  |
| Spreadsheets                        |         |         |         |
| Sigmasheet (Minerva)                |         | £39.95  | £46.94  |
| Schema (Clares)                     |         | £99.00  | £116.33 |
| WordProcessors                      |         |         |         |
| 1st Word Plus Release 2 (Acorn)     |         | £69.95  | £82.19  |
| Eas!Word (Minerva)                  |         | £31.95  | £37.54  |
| Protext 5.0 (Arnor)                 |         | £119.00 | £139.83 |
| Integrated Packa                    | ges     |         |         |
| Pipedream 3 (Colton)                | partie: | £119.00 | £139.83 |
| Desk Top Office (Minerva)           |         | £99.00  | £116.33 |
| Databases                           |         |         |         |
| Datavision (Silicon Vision)         |         | £127.45 | £149.75 |
| Flexifile (Minerva)                 |         | £119.00 | £139.83 |
| Multistore (Minerva)                |         | £199.00 | £233.83 |
| Genesis II (Oak Solutions)          |         | £119.00 | £139.83 |
| Knowledge Organiser (Clares)        |         | £42.00  | £49.35  |
| Accounting Softv                    | vare    |         |         |
| Financial Accountant (S. Vision)    |         | £233.75 | £274.66 |
| Home Accounts (Minerva)             |         | £39.45  | £46.35  |
| Business Accounts (Minerva)         |         | £325.00 | £381.88 |
| Office Tools (S. Vision)            |         | £318.75 | £374.53 |
| Languages                           |         |         |         |
| ANSI C Release 3 (Acorn)            |         | £125.00 | £146.88 |
| Desktop C (Acom)                    | NEW     | £189.00 | £222.08 |
| Desktop Assembler (/Acorn)          | NEW     | £129.00 | £151.58 |
| RiscForth (S. Vision)               |         | £127.45 | 149.75  |
| Music                               |         |         |         |
| Armadeus (Clares)                   |         | £61.00  | £71.68  |
| Rhapsody II (Clares)                | NEW     | £44.95  | £52.82  |
| Tracker (Serial Port)               |         | £38.95  | £45.77  |
| Utilities                           |         |         |         |
| Arc DFS (Dabs Press)                |         | £22.95  | £26.97  |
| Dot Matrix Colour Printer Driver (A | Ace)    | £12.72  | £14.95  |
| Education                           |         |         |         |
| Fun Sch. 3 Under 5's (Database)     | NEW     | £18.00  | £21.15  |
| Fun Sch. 3 5-7 (Database)           | NEW     | £18.00  | £21.15  |
| Fun Sch. 3 Over 7's                 | NEW     | £18.00  | £21.15  |
| Graphics Manipu                     | lati    | on      |         |
| Poster + Fonts (4Mation)            |         | £79.00  | £92.83  |
| Render Bender II (Clares)           | NEW     | £99.00  | £116.32 |
| Solids Render (S. Vision)           |         | £127.45 | £149.75 |
| Graphics - Art                      |         |         |         |
| Artisan II (Clares)                 |         | €49.95  | £58.69  |
| Pro Artisan (Clares)                |         | £79.00  | £92.83  |
| Atelier (Minerva)                   |         | £79.00  | £92.83  |
| Clipart Coll. Vol. 1 (General)      |         | £19.95  | £23.44  |
| Clipart Coll. Vol. 2 (General)      | NEW     | £25.49  | £29.95  |
| Clipart Coll. Vol. 3 (Animals)      | NEW     | £25.49  | £29.95  |
| Clipart Coll. Vol. 4 (Sport)        | NEW     | £25.49  | £29.95  |
| Clipart Coll. Vol. 5 (Characters)   | NEW     | £25.49  | £29.95  |

## Monitors

NEW

£110.45

£26.97

210Mb Drive

£94.00

£22.95

Misc

PC-Emulator V1.6 (Acorn)

Investigator II (Serial Port)

| Acorn Colour Monitor (AKF17)  | £200.00 | £235.00 |
|---|---------|---------|
| Philips CM8833 II Colour Monitor  | £209.00 | £245.58 |
| Microvitec CUB 3000   | £199.00 | £233.83 |
| Taxan MultiVision 775 (0.28 d.p.)   | £389.00 | £457.08 |
| Taxan MultiVision 795A (0.26 d.p.)<br>(FST Black Trinitron Anti-Glare Tube) | £469.00 | £551.08 |
| Taxan Viking II (19" Mono. MS)  | £749.00 | £880.08 |

#### Games

| Games                              |       |          |        |
|------------------------------------|-------|----------|--------|
| Arcpinball (Shibumi)               |       | £18.00   | £21.15 |
| ARCticulate (4th Dim.)             |       | £18.00   | £21.15 |
| ARCtist (4th Dim.)                 | NEW   | £18.00   | £21.15 |
| Ballarena (Eterna)                 |       | £14.45   | £16.98 |
| Blowpipe (Eclipse)                 |       | £14.45   | £16.98 |
| Blaston (Eterna)                   |       | £14.45   | £16.98 |
| Boogie Buggy (4th Dim.)            |       | £18.00   | £21.15 |
| Break 147/Superpool (4th Dim)      | NEW   | £18.00   | £21.15 |
| Bubblefair (Eterna)                | NEW   | £14.45   | £16.98 |
| Chess 3D (Micropower)              |       | £14.45   | £16.98 |
| Chequered Flag (CIS)               | NEW   | £18.00   | £21.15 |
| Chocks Away Version II (4th Dim.)  |       | £18.00   | £21.15 |
| Chocks Away Extra Missions         |       | £14.45   | £16.98 |
| Chocks Away Compendium             |       | £28.00   | £32.90 |
| Chuck Rock (Krisalis)              | NEW   | £19.00   | £22.33 |
| Drop Ship (4th Dim.)               |       | £14.45   | £16.98 |
| E - Type (4th Dim.)                |       | £14.45   | £16.98 |
| E - Type 100 Miles (4th Dim.)      |       | £12.75   | £14.98 |
| Fine Racer (Eterna)                |       | £14.45   | £16.98 |
| Holed Out (4th Dim.)               |       | £14.45   | £16.98 |
| Holed Out Designer (4th Dim.)      |       | £14.45   | £16.98 |
| Holed Out Vol. 1 or 2 (4th Dim.)   |       | £12.75   | £14.98 |
| Hostages (Superior)                |       | £14.45   | £16.98 |
| Iron Lord (Cygnus)                 |       | £14.45   | £16.98 |
| Inertia (4th Dim.)                 |       | £14.45   | £16.98 |
| Interdictor 2 (Clares)             |       | £26.00   | £30.55 |
| Lemmings (Krisalis)                | NEW   | £19.00   | £22.33 |
| Mad Professor Mariarti (Krisalis)  |       | £14.45   | £16.98 |
| Manchester Utd. (Krisalis)         |       | £19.00   | £22.33 |
| Manchester Utd. Europe (Krisalis)  | NEW   | £19.00   | £22.33 |
| Master Break (Superior)            |       | £14.45   | £16.98 |
| Microdrive 3D USA Courses          |       | £10.45   | £12.28 |
| Microdrive 3D European Co.         | NEW   | £10.45   | £12.28 |
| Mig-29 Fulcrum (Domark)            | NEW   | £29.00   | £34.08 |
| Minipack 5 (C.I.S.)                |       | £23.95   | £28.14 |
| Nevryon (4th Dim.)                 |       | £14.45   | £16.98 |
| No Excuses (Arcana)                |       | £14.45   | £16.98 |
| Poizone (Eterna)                   | NEW   | £14.45   | £16.98 |
| Powerband V. II (4th Dim.)         |       | £18.00   | £21.15 |
| The Real McCoy 1 or 2 (4th Dim.)   |       | £21.50   | £25.26 |
| Turtles Tour the World (E. Crayon) | )     | £14.45   | £16.98 |
| Twin World (Cygnus)                |       | £14.45   | £16.98 |
| Saloon Cars (4th Dim.)             | NEW   | £18.00   | £21.15 |
| Speech (Superior)                  |       | £14.45   | £16.98 |
| Wimp Game (4th Dim.)               |       | £14.45   | £16.98 |
| World Champ. Boxing Man. (Krisa    | lis)  | £19.00   | £22.33 |
| World Champ. Squash (Krisalis)     | NEW   | £19.00   | £22.33 |
| Wonderland (Virgin)                |       | £24.50   | £25.79 |
| Zelanites (MicroPower)             | NEW   | £18.00   | £21.15 |
| Please ring for current            | price | s on sot | tware  |
|                                    |       |          |        |

NOT listed here

## AU Show

11th-13th October

New Products Are:

£54.95 £64.57 A3000 Podule Expansion System 2 slot external podule expansion case allowing the use of two compatible 400 series cards simultaneously.

For example, the CC Laser Direct Card with an Orion IDE

IDE Interface and drives for Archimedes and A3000's 400 Series IDE Interface £119.00 139.83

IDE Drive for use with above Standard Range 20Mb Drive £75.00 £88.13 43Mb Drive £119.00 £139.83 85Mb Drive £210.33 £179.00 200Mb Drive £389.00 £457.08 **Professional Range** 50Mb Drive £179.00 £210.33 125Mb Drive £299.00 £351.33

£519.00

£609.83

Both ranges of drives come complete with everything required to get the drive installed and running in your machine.

he Archimedes was almost made for desktop publishing. With multi tasking, a Wimp environment, and outline fonts it is capable of running sophisticated DTP systems. Add a good range of printer drivers to that list and it becomes an unbeatable combination. Acorn's Desktop Publisher application (ADTP), which is included in some Learning Curve packages, is many people's introduction to desktop publishing. It isn't really suited to 'professional' use for this Impression or Ovation are better - but the principles and skills learned with ADTP are easily transferred to more advanced packages.

All of these Arc DTP packages are described as 'frame based'. What this means is that anything you put on a page - some text or an illustration - has to go in a box, or frame. The size of the box controls the width of a column of text or the size of a picture. By moving the box you can move the text or illustration around the page as a block. Several frames can be put on one page and they can contain text, pictures, headlines, logos and so on, building up the image that you want.

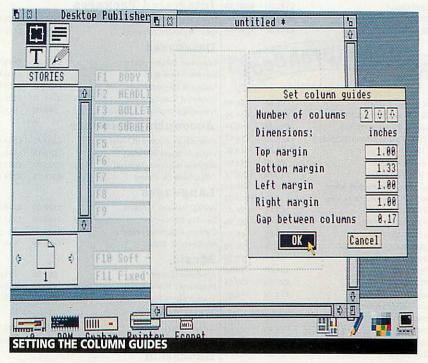
A frame can hold one of four types of object; text you type in, text imported from a text file, a drawing or a sprite. So Acorn Desktop Publisher does not form a complete system on its own you need applications like Draw or Paint to create illustrations and Edit or a wordprocessor to create the original text.

ADTP runs like any Risc OS software. Clicking on its icon bar icon opens two windows, one represents the blank page you are working on, and the other is the tool panel. With any new document the first thing to decide is the size of the margins, columns and so on. It's tempting to cram text on to a single page, leaving no space around the edges - but documents are more attractive and easier to read if you leave generous margins.

The page shown in in the sketch could be suitable for a school magazine. To create a similiar document, you can set the margins in the following way. Choose Set Column Guides from the Page sub-menu: the dialogue box allows you to type in the sizes of the margins. One inch all round should do it, with two columns. Press RETURN or click on Okay and you will see the green dotted guidelines in the page window have changed. Pressing SHIFT-F11 brings the whole page into view so you can see it all. Conversely, SHIFT-F9 zooms in on the page to full size, but you can't see all of it on most monitors, even with the windows at full size.



# PERFECTING THE PAGE



### **GRAHAM BELL**

explains how you can get the most out of desktop publishing, in our continuing series covering major applications

You can use the View sub-menu to change the size too. Make the window fill the whole screen, then press SHIFT-F11 so you can see the whole page. Now drag the page window right, so you can see the four main icons in the toolbox too this arrangement is convenient for most work.

The green guidelines make it easy to draw frames at the right places on the page - frames that you draw can be aligned, or snapped, to the guides. Click on the Frame mode icon (the top left icon in the toolbox), put the pointer on the page, and drag out a box. The red rectangle with eight handles or 'ears' is a frame - you can drag the ears to adjust the size of the frame and to snap the edges to one of the green column guides. Notice how the pointer changes shape it's normally a cross-hair in Frame mode, but it changes to a hand if you try to drag the frame's ears. You can also drag the whole frame around by holding Select down in the middle.

Now there's a frame on the page, you need some text to go in it. ADTP can import files from First Word Plus, and it retains all the bold, italic and underline highlights, or it can import plain text from Edit. With Edit, you need to separate the paragraphs with a blank line. The example document has about 400 words in the main text.

To put the text on the page, make sure you're in Frame mode, click in the frame so that its ears show, then drag the text file icon on to the frame. The text - or part of it - will appear in the frame. If there's some text missing, then the bottom of the red frame is dotted.

Also, the name of the text file appears in a list of 'stories' in the toolbox. This is the key to extending the text. You can't just make the frame bigger if all the text doesn't fit, because each column of text has to be in its own separate frame. You can draw a second frame on the right of the page in exactly the same way as the first. Align it with the green guides by dragging its ears, so it's the same size as the first frame.

Now, to make the remainder of the text 'flow' into the new frame, make sure it's highlighted (the ears show), then click on the name of the text file in the list in the toolbox. If it's not there, don't panic. There are three lists for stories, sprites and line art. Just click where it says Line Art or Sprites, until the Stories list appears.

The remainder of the text should now appear in the new frame, partly filling it. The point about 'flowing' is that if you shorten the first frame, text won't be lost - more will overflow into the second frame.

#### STYLES

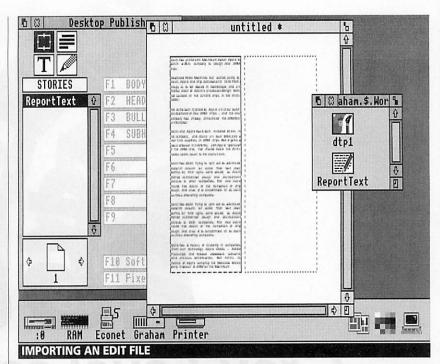
When you import plain text like this, it assumes a style called 'Body Text'. This is usually the Homerton typeface at 10 point size - a bit bigger than the text in this magazine. By altering the 'style sheet' for Body text, you can alter the look of all the text that uses this style.

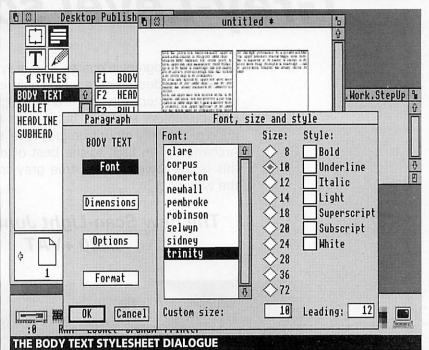
To do this, you need to use Paragraph mode. ADTP is modal: that is, in one mode certain options are available, in another mode a different set of options are available. In Frame mode you can draw frames and place text files: changing text styles is done in Paragraph mode, To select Paragraph mode, click on the top right of the four icons in the toolbox.

Now a list of four style sheets appears in the toolbox - so double-click on Body text. A new four-part dialogue appears. The first part allows you to change the typeface and size: for this document, change it to Trinity, 10 point on 12 point leading. The 10pt is the size of the text and the 12pt is the distance between each line. The other three parts of the dialogue can be reached by clicking the buttons on the left: the only one you need to change is Dimensions. This controls things like the indent on the first line of each paragraph and the gaps between paragraphs. You want the produce text in a more solid form, so reduce the Space above paragraph to zero and set the First line indent to 0.17in. Now click on Okay. You'll see the text re-arrange itself to your new specification, smaller and without the gaps between paragraphs.

Some of the paragraphs in the text are just single words - little headings within the text to break it up into readable, organised chunks. These are called crossheads, and you need to create a brand new style sheet for them. Press Menu and choose New style from the Paragraph submenu. Now make a copy of Body text and call it 'Crosshead'.

In the style sheet dialogue, you can make the crossheads Homerton, bold, 10pt on 12pt leading. In the Dimensions section make the Space above 0.17in, first line indent zero, then click





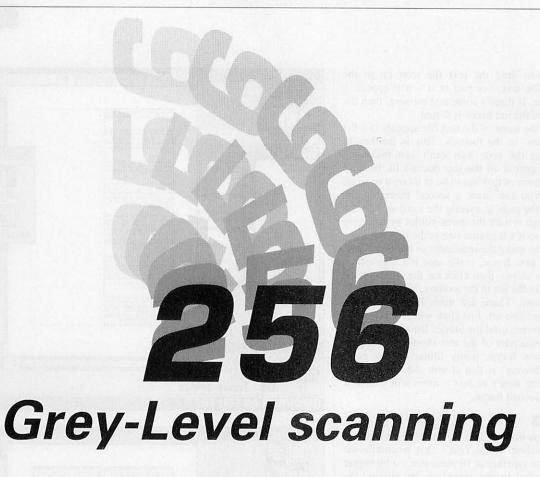
#### 1MB MACHINES

ADTP can be run on an Arc with only 1Mb of memory, but it's a tight fit. The ideal is at least a 2Mb machine with a hard disc but the memory is more important than the disc if you have to make a choice. The lack of memory slows ADTP down and limits the complexity of documents you can create. You'll have to follow the configuration advice in the ADTP release notes carefully. When you want to print, changing screen mode 0 using the Palette application will speed things up a lot.

Okay. Of course, Crosshead style isn't used in the text yet, so nothing changes. But in Paragraph mode, you can click Select on the crosshead - it turns black - then choose a new style for it from the list in the toolbox. In this way you can change all the crossheads to the Crosshead style.

There is also plenty of space on the page for a headline and a picture. Return to Frame mode, and put in a new frame at the top of the page to hold the headline. As soon as you put in the frame, you will see the text re-arrange itself out of the way, because the new frame repels the text downwards.

To type the headline in, you use Text mode: the T icon in the toolbox. Click the T, then click into the new frame and type the headline - of course, it assumes the Body text style at first so



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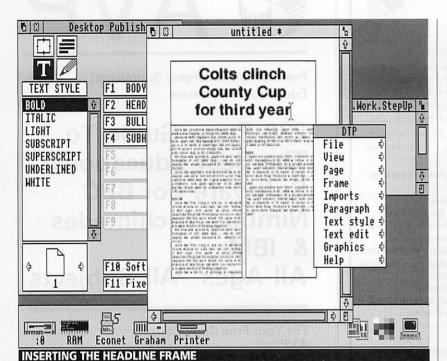


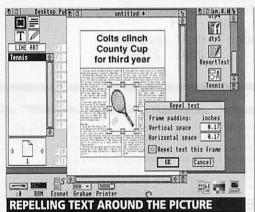
An example scanned picture, reproduced actual size.



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it's too small. Now choose Paragraph mode, highlight the headline then choose Headline style from the toolbox. It's probably still the wrong size, so you can alter the Headline stylesheet in the same way as you did for Body Text: double-click on Headline in the toolbox list then change things in the style-sheet dialogue. The headline in the example is 48pt Homerton bold with no space above paragraphs and no indents. You can also centre it in the frame using the last, Format section of the dialogue.

Finally the picture. This requires a new frame, but centred on the page. The best way is to reset those dotted-green page guides. From the Page sub-menu (you need Frame mode again), change the column guides to give three columns instead of two. You can't see the guides, as they are hidden by the main text frames, but a new frame will still snap to them easily. Adjust the height of the frame by dragging the top and bottom ears, so the main text just fits - note again the new frame repels the text away from its sides. You can change just how far it repels with the Repel text option on the Frame submenu: distances of 0.17in to the left and right are about right.

To add the illustration, you need only drag in a Sprite or Draw file into the frame - it could be a scanned photograph or a drawn logo for exam-

#### **DESIGN HINTS**

- Try to work out what you want your document to look like before you begin, leave plenty of room for margins and headlines, and don't try to cram too many things on the page.
- Don't underline words for emphasis; bold or italics look better, or use blobs from the Selwyn font to pick out items from a list.
- Use the right character. For example, use x not X for multiplication. Don't use ', use ' (ALT-145). Dashes - like ALT-151 - are longer than hyphens (-). The full table of characters is in the back of the ADTP manual.
- Don't try anything too complex with ADTP. It has limitations you can't get around (no fractionally leading, condensed text is impossible). So move on to a more advanced application as your needs grow.
- Buy a book like Introduction to DTP by John Miles to learn more about typography and design.

ple. You can now save your document in the normal way, or print it out. If you've got access to a laser printer, great. But even dot-matrix machines can produce remarkably good results.

If you find you want to make minor amendments to the text, you can edit it using Text mode - and you'll probably want to zoom in to double size with SHIFT-F8. But you cannot export the text back to Edit or a wordprocessor for more major surgery, nor can you re-export drawings or spirtes. So it's important to get things right - and don't delete the originals, just in case. Using Text mode you can alter things like the size and typeface of the text, as well as picking out sections in bold or italic. But don't use this technique to make changes like making up a heading - set up a new style sheet instead.

#### HINTS AND TIPS

One of the problems with ADTP is that when you import a picture the original proportions are lost - it gets stretched or squashed to fit the space available in the frame. For most pictures, there is a way to get round it. First, note the exact width and height of the ADTP frame double-clicking on a frame pops up its dimensions. Then in Draw, use Select all, then Group all the elements of your picture together. Use Magnify to change the picture to the right size using the grid as a guide.

Now select the Rectangle tool and draw a border around your picture. Using the grid, make the border exactly the same size as the ADTP frame, and ensure it encloses all of your original picture. Once it is right, select the border and change the Line colour to None. Save, and import into ADTP. The same thing applies to sprites - remember that they can be imported into Draw too.

Consistency is one of the better signs in a publication. With the school magazine page for example, you might want lots more pages to share the same style. The best way to achieve this is to use the 'Master Page'. Use Goto on the Page submenu to open the Master page. On this page, put two new frames like the main text frames on the real page - you might want to reset the page guides to two columns first. Now use Goto to return to page one. Nothing will have changed. But click on the right arrow at the bottom of the toolbox, as if turning a new page in a book. ADTP creates a new page - but instead of being blank, it inherits the features of the master page. The master itself never prints out - it's only used as a basis for any new pages you create. If every page has a logo, for instance, you can put it on the master.

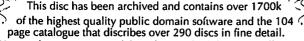
If you want consistency throughout several documents, a kind of 'house style', then a 'template file' is an extension of this idea. Once you've set up your master page and created all the necessary style sheets, you can save a 'template' - essentially it's a document without any text. In fact the menu option is Save style sheet - but it saves all the styles and the details of the master page too.

For the next document, double-click on this template file, and you'll have a fresh, blank document, but all the styles and so on will be the same as for your original - again encouraging consistency and making for an impressive look.



### The Datafile PD

Super Catalogue/Demo disc III



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lot of great features such as converting standard trackers to stereo. !Reverse - This is for fun and it reverses the direction of your pointer.

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User Port Extension lead 0.5M



# LIFE IN THE TREES

uring World War 2, a Dutch engineer, Bosman, was made to work on submarine design by the Nazis. Resenting this forced labour, he resolved to work as slowly as possible.

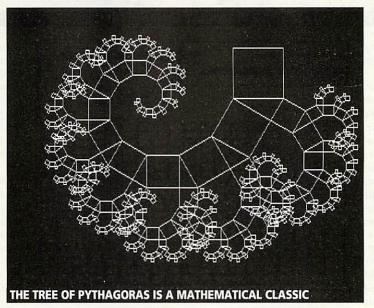
One morning, while he was considering Pythagoras' theorem of right-angled triangles, he wondered what would happen if two new triangles were drawn on to the side of the original squares. He then wondered what would happen if two new squares were drawn on to these triangles. All he had was a pencil, a ruler and a large piece of paper so he started drawing.

Needless to say, the submarine was never finished,

but the 'tree of Pythagoras' was discovered and now with the aid of modern computers it can be explored to levels that Bosman probably never dreamed of.

Albert's original article (in issue 55, February 1987) featured three listings. These have been combined into one program, Pythagoras, which can be found on the yellow pages. When you run the program you will be asked for six parameters to describe the tree you want to create. The first two, x coordinate and y coordinate represent the centre of the first square drawn. This square is the largest and can be thought of as the tree's root. Initial size sets the dimensions of this root square and the value is, in fact, half the length of one side of the root square.

Of course, it is not possible to completely draw a tree, as they are recursive in nature and therefore of infinite complexity. A form of limitation needs to be incorporated, so that the program will terminate at some point. The minimum size parameter sets the point at which the



DAVE LAWRENCE

revises Pythagorus, builds an automaton and wrestles with words in our series of eight-bitprogram classics

recursion stops. If a square 'branch' is smaller than this value, then no further triangles are added.

The start angle is the angle inside the triangles. Bosman's original tree was based on an isosceles triangle (one with two sides of equal length) so the angle was 45°. By varying this value, many different types of tree can be discovered. The final parameter is Alternation and this allows the start angle to be altered as the tree is being drawn. The 'root' square has a value of 0, the two squares on its triangle have value 1, the four squares on their triangles have value 2 and so on. This can, for instance be set so that if the value MOD alternation is zero,

the angle used for the triangle is subtracted from 90°. So entering 30 for the angle and two for the alternation, the angle will swap between 30° and 60°. Table 2 shows a few example sets of values

The program itself is relatively simple. As is often the case, the dirty work is performed by a recursive procedure, called DEF PROCtree. The coordinates of the root square and the apex of its triangle are passed to PROCtree. This first checks if the square is large enough to draw and if so, plots the two squares on the sides of its triangle. A little bit of trigonometrical jiggery-pokery is perfomed to calculate the co-ordinates of the next level of 'branches', then PROCtree is called recursively to deal with them.

Note that the root square itself is drawn outside the procedure and PROCtree in fact draws pairs of branches. This is not really the best way to write a recursive procedure but all the same, it does illustrate the fascinating world of Pythagorean trees.

# 3D, 2D, 1D...

In June's Pieces of 8, we re-printed a feature from March 1984 by Malcolm Banthorpe. This showed what happens when John Conway's game of Life is moved into the third dimension. This month I'd like to take not just one step, but two steps backwards and look at Susan Stepney's one dimensional life from the November 1988 issue of BAU.

1D Life (or to be more precise, one-dimensional cellular automata) starts with a line of single cells. Each cell can have one of several states (represented by different colours). In subsequent generations, the 'new' state of a cell is deter-

nearby cells. The patterns produced are created by displaying generations on adjacent lines down the screen.

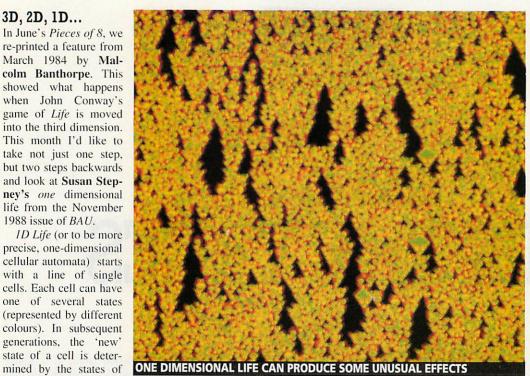
The cells evolve according to a given rule which is based on N, the neighbourhood, and S, the number of states. For example, the simplest, interesting automaton has two states (0 and 1) and a neighbourhood of 1. This means that, when working out the future of a given cell only its immediate neighbours are considered. With this situation there are only eight possible 'cases' that can arise. These can be represented by 111, 110, 101, 100, 011, 010, 001 and 000 where the middle digit represents the cell in question and the outside pair represent its neighbours.

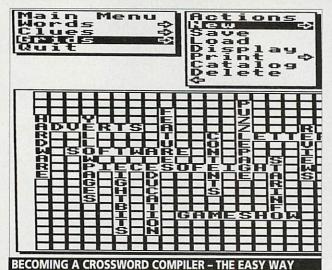
A rule for evolution can be given in one of two ways - as an explicit 'rule number' or a 'totalistic' code. A rule number can be obtained by writing down the resulting state for the given cell in each possible 'case'. For example, with N=1 and S=2 (as above) if you wanted a cell to be created when it has only one neighbour, the rule would be 01011010. A totalistic code is lot simpler; the sum of each case is calculated (32212110) and an outcome given for each total.

IDlife on the yellow pages will display automata based on totalistic codes. Example data can be found in table 3. If you'd like to fiddle with rule numbers, make the following changes:

550 index%=index%\*s%+? (a%+i%+k%) 730 dim%=s%^(2\*n%+1)

Rules fall broadly into four different groups. These are instant death, simple structures, continuously growing structures and chaos. The 'game' is to try and find the prettiest ones!





**CROSSED LINES** 

In the same issue as the original ID Life, Joe Telford wrote a crossword compiler in his Jottings column. Given the popularity of BAU's Puzzle Page crossword, we thought this a timely moment to resurrect Joe's original program.

There are essentially two approaches to building a crossword. You can either start with a grid, create a pattern of black squares and then fill in whatever words fit Alternatively, you can start with a list of words, based on a theme, and try to fit them together. Joe thought that the latter method was suitable for conversion to a computer and his program will accept a list of words and

attempt to fit them on to a grid. Once successful, you are invited to enter a clue for each word. The final puzzle can be saved, edited or printed out.

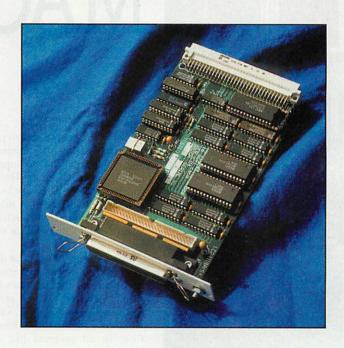
Unfortunately, the main part of the program (CWD2) is a trifle on the large size and will only fit on a Master or Beeb with shadow Ram. If you have access to a toolkit Rom, the listing can be 'crunched' to fit in a standard Beeb, but you will have to carefully change the function names in the DATA statements at the end of the program. The program uses directories W, X and C, so NET and ADFS users will have to create these first. Lines 6770 and 6780 should be changed according to the filing system you use.

```
REM
NET:
        *DIR
        *DIR dir1.dir2...
       *DIR
       *DIR
```

The compiler program is menu-driven. Items can be selected with the up and down cursor keys and 'chosen' by pressing RETURN. Selections marked with arrows lead to sub-menus. To create a crossword, select New from the Actions submenu of Words and type in your word list. To build the crossword itself, choose New from your Grids menu. You have the option of either Tight or Open - try both possibilities and you will soon see the difference!

Type in clues from the New option on the Clues menu. Finally, select Print from the Grids menu and Print from the Clues menu to print your puzzle out. Joe recommends that words, grids, and clues are saved at each stage by selecting the Save option from the relevant menu.

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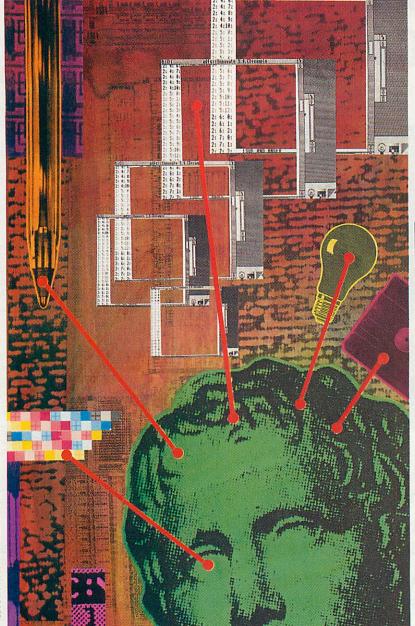
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# Risc OS windows. create file formats.

Windows and menus can be a daunting prospect for programmers. TONY PATTERSON, the

creator of the Innovation ideas processor, shares the secrets of his success

# MENU MAGIC

or many people new to programming on the Archimedes, the prospect of writing programs that are co-operative and multitasking can be daunting. However, it needn't be so, if you know a few tricks of the applicationwriting trade. Remember that you don't have to write everything from scratch - the windowing system can do an awful lot of the hard work for

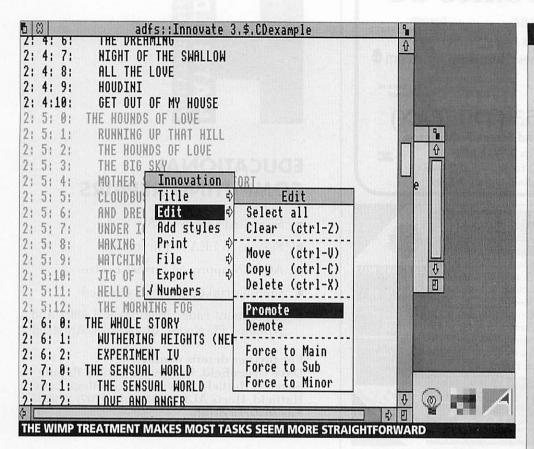
Indeed, some of the most difficult parts - such as drawing windows and reading input from the keyboard and mouse - can be delegated to the Wimp. Also the FormEd program, available on Sid or with Acorn Ansi C, can be used to design windows with the sort of ease you would expect from an art program like Paint. This article should give some much-needed guidance to programmers who wish to start programming for

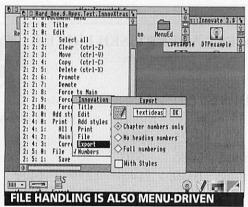
Last month, I introduced the Innovation ideas processor. Innovation is referred to as an editor that is, a program which can be used to load, alter and save a file. With all editors, one of the most important parts of the design is how to

If you are making a file format from scratch, it is important to get it right first time. Changing it later could be difficult - especially if you have saved several files to disc. Using a compiled language like C allows you to make use of structured types or records to make file manipulation simpler. This also makes it far easier to change the format of a file. Bearing these points in mind, this is how I started to create the Innovation ideas processor.

Most file formats start with a header, giving global information on the file. In Innovation this consists of the number of ideas in the file, followed by the title and the heading styles. After the header come several data items, the ideas themselves, along with their heading levels within Innovation.

I started writing Innovation by creating a very simple Basic program. The save routine from the program was later used as the basis for the finished program's save procedure and the purpose of this program was to create a short file which could be loaded into the multi-tasking ideas processor. In this way, I could write the screen redrawing routines and have something to test them with, as the redraw had to be working correctly before any of the editing functions could be written.





In writing the editing functions I had to choose whether to write my own functions, or to take advantage of writeable icons, leaving the bulk of the work to the Wimp. In the end I decided against the former option. One disadvantage is that large scale editing, (group copying and deleting), would be made more difficult by using writeable icons because the indirection fields of many icons would need to be changed. This can't be done legally on an open window.

The first editing function that I wrote was the heading level adjustment with the mouse. It is important to try to minimise the amount of the work area that is invalidated by Wimp\_ForceRedraw or the application Wimp\_UpdateWindow. Redrawing large areas of screen each time a small alteration is made not only slows the program down, but soon becomes irritating for the user.

Innovation uses two functions which update sections of the screen. PROCupdateline(n) redraws the nth idea after a line edit. PROCchapters(n), invalidates the numbers area, beginning at the nth idea, and ending at the end of the file, using

Wimp ForceRedraw. During keyboard input it is particularly important to maintain fast update to avoid distracting the user. PROCupdateline uses Wimp\_UpdateWindow to alter the window's contents. This involves writing more code to redraw the line, but it updates the screen immediately, instead of waiting for another call to Wimp\_Poll. This makes it well worth using for any sort of interactive input.

Up until this point, I was using templates copied from the Edit application, but in order to provide the more specialised functions of the program, I needed to make a set of more appropriate templates. In fact, it was soon after this that I decided to write a companion to FormEd, to replace the cumbersome Basic routines I was using to create my menus.

I called it MenuEd and when loaded, MenuEd sits quietly on the icon bar until a special text file is dropped on to it. The text file contains all the menu definitions, in an easy-to-read, easyto-alter format. It can be loaded in Edit and altered at will, and when it is dropped on to the MenuEd icon, MenuEd obligingly creates a menu template which can be loaded into your own applications by one short procedure.

The file that MenuEd creates is saved in the directory containing the original text file. It is given the filename Menus and the Template file type (&FEC) in order to distinguish it from other files. Despite this, it is not compatible with window template files, so it should not be loaded into FormEd, as it will cause an error, or possibly a crash. The box on page 77 shows you, how to create the text files for MenuEd, together with the menu file for Innovation. MenuEd itself can be found in the yellow pages and on the monthly disc, together with Basic assembler and C procedures for loading the menu templates.

# **LOADING MENUS**

The call to loadmenus should be followed by a set of statements to retrieve the menus' addresses from the free memory space. All the menu addresses are provided, using the same order that was used in the definition file. (You need not extract the addresses of sub-menus, which were linked to the menu tree with the 'm' option). The following Basic fragment illustrates how to achieve this:

PROCloadmenus("<Application-\$Dir>.Menus",free%,1): first\_menu% = free%!0 main\_menu%= free%!4 REM We do not want the third menu, so skip to the fourth edit\_menu%= free%!12

You can now use these variables directly with Wimp\_CreateMenu to open menus with a line like the following:

SYS "Wimp\_CreateMenu" ,,,main\_menu%,x%,y%

Note the double commas, after the second quote. They are important. The menu addresses can also be used to directly access the menu structure in order to shade or tick items during execution, and to find the addresses of indirected writeable items so that you can read them.

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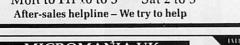
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When an attempt is made to drag an icon with Select – a mouse click, with buttons value &10, on that icon is then reported. Innovation responds to this by using the two functions Wimp\_GetWindowState and Wimp\_GetIconState, to find the OS coordinates of the icon, and Wimp\_DragBox type 5 to initiate a fixed-size box drag. When this ends, the Wimp sends back the end of drag event to tell the program which window the file was dropped in. Then the save can begin. With the dialogues working correctly, I started to write a proper Save routine.

The next task was to implement the Edit menu functions. Most of these call the procedure, PROCselect(p%), which uses a loop to find the selected items. It then applies a function to each of them, according to p% which is taken directly from their position in the menu. This can also be called by a function key, using an appropriate value for p%.

The Add Styles dialogue uses several writeable icons, and it is made friendlier by using the RETURN key to pass the caret around the icons. It is also up to an application to redisplay a menu when a selection is made with adjust. Few things are more irritating than repeatedly tracing through several layers of menus.

The complex functions to deal with printing and Ram transfer needed to be written at this stage. Under Risc OS, the preferred method of printing is to a file. This can be very useful as you can use an environmental variable to direct the output. Innovation uses Idea\$PrintFile.

Setting this to a filename will print the output to a file, which can save time and paper when you are checking the results. The Ram transfer of files is a great time-saver in Risc OS, but can be difficult to implement. I developed several functions for Innovation which provide an interface similar to that of the file commands mentioned earlier. This makes them particularly suitable for transferring converted format files, such as the file export variations.

There are several global variables that need to be set up to 'open' an output file. Firstly, templates% should be set up to point at an area of memory of size sbuf%, where sbuf% is a multiple of four. Larger values of sbuf% obviously use more memory, but achieve slightly faster transfers. This can be done at the beginning of the program. Every time a file is opened base% and dest% should be set to 0. To write a byte to the file use PROCramtransmitbyte(value%), and to transmit a string use PROCramtransmitstring(a\$). When you have finished, you can close the file with PROCensuretransmission.

To read a file in this way you must know how long the file will be, Innovation finds this out from the file itself. Open the file as before, only this time, set base% to sbuf% and dest% to sbuf%+1. FNramreceivebyte and FNramreceivestring read in the appropriate values. Despite economising on local variables, this routine is fairly slow - so for editors using large files, it is probably better to seek an alternative solution.

Hopefully, by now you will have gained some ideas about how to write applications and you can also get more ideas by studying the code of other Basic programs. Once you have written one application your confidence will grow, even if, sometimes, your motivation doesn't keep

# **CREATING TEXT FILES**

The format of a menu creation file is fairly rigid, so it is important to follow these instructions closely. In particular, it is important not to include surplus blank lines, such as untitled menus, as they often have special meanings. If you want to leave lines blank for clarity, put a single hash ('#') at the beginning of the line. This must be the very first character, and it creates a comment line.

It is useful to use these comment lines before each menu, to number them for reference purposes. The first noncomment line in the description file should contain a single decimal number which tells MenuEd how many menus to expect. When counting the number of menus, you should count all non-leaf menus and leaf menus, but not dialogue boxes. It is possible to define a submenu which is available from more than one place, such as the background and foreground sub-menus in Edit. If the menu is only defined once, it should only be counted once. On the lines that come after this number, there should be a sequence of exactly that number of menu definitions.

Each menu definition is made up of one line for the menu title, and one line for each of the menu items. Each menu item is followed optionally by flags, used to set menu attributes, and a validation string which is used to censor input to writeable menus. If present, the flags should be placed between curly brackets, and so should the validation string. The final option in a menu should have the 'e' flag set to indicate that it is the end of the menu.

The following flags are defined:

- c<fqd col>Set text colour
- b<bckgd col>Set background colour
- m<menu no.> Link sub-menu to entry
- w<window identifier> Link dialogue box to entry
- tTick this item
- ILine follows
- s Shade out this item
- e End of menu
- i<input width>[,<buffer length>]] Input item
- p Picture (sPrite)

A window identifier is an arbitrary value. Your program should replace it with the address of a menu created at run-time, such as a font menu, or the window handle of a dialogue box. It can do this by capturing Wimp message &400C0 (the pointer passing over submenu arrow), and using a call like

SYS "Wimp\_CreateSubMenu" "FNdialogue(q%!20),q%!24,q%!28

where FNdialogue is the function to convert the arbitrary handle into a meaningful one. Look at Innovation to see how this is done.

A menu number n, represents the nth menu in the file. It is used with the m flag to create a sub-menu using a menu from the creation file. The i flag is followed by two numerical parameters. The first sets the width of the menu, determining how many characters of input can be seen at any one time. If this is less than the total length of the input string, then the second parameter should be given. This indicates the maximum number of characters allowed, not including the terminating character. No extra workspace need be allocated for writeable entries.

The menu file that is created is no use until your application is provided with the loading function. I have provided Arm assembler, Basic and C versions of the loadmenus procedure. The Basic loadmenus procedure may be INSTALLed, loaded as a LIBRARY or an OVERLAY, or it can be APPENDED to the program - it's up to you. Before you call it, you should set up a variable to point to a free area of memory, that is at least four times the number of menus long in bytes.

This variable is used to return the addresses of the menus and as soon as that is done, you can use that memory area for other purposes, such as polling the Wimp. The procedure takes three parameters, the filename, the pointer to the free memory and a pointer to the sprite area. If you are not using sprite menus, or if your sprites are in the system sprite pool, you should set the last parameter to 1.

pace. If you are really serious about programming for the desktop, then you should consider using Ansi C, which comes complete with a massive library of functions These offer an unparalleled ease of programming.

However you do it, there are some golden rules. It is best to start off with small simple programs - once you get the hang of these, you can start to write larger programs. Don't forget, you can always learn a lot from your fellow programmers. It should help you to create professional, and useful, programs of your own.



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| Po82            |                 |            |           |         | Con 🕶 😘      |          |         |        |          |        |             |         |
| Po83            |                 |            |           |         |              |          |         |        |          |        |             |         |
| Po84            | This F.F.       |            |           |         |              |          |         |        |          |        |             |         |
| Menu Editor     | 75              |            |           |         |              |          |         |        |          |        |             |         |

# \*Info

```
620 LSR A:LSR A
630 AND #12
640 TAX
650 LDY #0
660 JSR plot
670 PLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1960 CMP #0
1970 BEQ store2
1980 CMP #1
1990 BEQ wire2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1290 LDY #0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1298 LDY #8
1380 :
1310 .copyloop
1328 LDA (scraddr),Y
1338 STA (addrdata),Y
1340 INY
 Listing 1
                    10 REM >WWBrc (Info1) - Circuit Autom
aton Source
20 REM By Andrew Pepperell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000 SEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2010 SBC #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1350 NNY
1350 NNE copyloop
1360 INC scraddr+1
1370 INC addrdata+1
1380 INX
1390 CPX #5
                    30 REM For B/B+/M/C/E/(165Host)
40 REM (C) BAU November 1991
                                                                                                                                                                                                                                                                                                                      68Ø PHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2020 JMP store2
                                                                                                                                                                                                                                                                                                                    680 PHA
690 LSR A:LSR A
700 AND #12
710 TAX
720 LDY #8
730 JSR plot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2020 of store2
2036 :
2040 .wire2
2059 JSR count
2050 LDA neighbours
2070 BEQ isawire2
2070 BEQ isawire2
2109 LDA 43
2110 JMP store2
2120 :
2130 .isawire2
2146 LDA #1
2159 .store2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2030
50 :
60 IF PAGE<£1900 THEN PAGE=£1900:CHAI
N "WWesco"
70 :
80 MODE 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1400 BNE copyloop
1410 LDA #0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1418 LDA #0
1420 STA row
1430:
1440 .rowloop
1450 ASL A
1470 LDA datatable, X
1470 LDA datatable+1, X
1500 STA addrdata
1493 LDA datatable+1, X
1500 STA addrdata+1
1510 LDY #0
1520 STY column
1530 MP columnloop
1540:
                                                                                                                                                                                                                                                                                                                      740 PLA
                    90 PROCassemble
                                                                                                                                                                                                                                                                                                                      750 PHA
90 PROCEMENTE
100 PROCChecksum
110 OSCLI("SAVE WWcode "+STR$"start+"
"+STR$"P%)
120 PRINT"Code saved O.K."
130 END
                                                                                                                                                                                                                                                                                                                      76Ø AND #12
                                                                                                                                                                                                                                                                                                                   760 AND #12
770 TAX
780 LDY #16
790 JSR plot
800 PLA
810 AND #3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2140 LDA #1
2150 .store2
2160 ASL A:ASL A
2170 ASL A:ASL A
2180 CLC
2190 ADC byte
2200 STA byte
2210 INC column
2220 LDY column
2220 LDY column
2220 LDY column
2220 CDF column
2220 CDF column
2220 CDF column
2220 CDF column
2230 CDF column
2230 CDF column
2230 CDF column
2230 CDF column
2330 DSC colum
                                                                                                                                                                                                                                                                                                          866 PLA
810 AND $3
820 ASL A:ASL A
830 TAX
840 LDY $24
850 JSR plot
860 LDA scraddr
870 CLC
880 ADC $32
839 STA scraddr
900 BCC dispnextfour
910 INC scraddr+1
920:
940 INC column
950 LDA column
950 LDA column
950 CMP $20
970 BNE displayfour
980 INC row
990 LDA row
1000 CMP $64
1018 BNE displayrow
1020 RTS
             150 DEF PROCassemble
          150 DEF PROCASSEM
160 osbyte=&FFF4
170 oswrch=&FFEE
180 osrdch=&FFE0
190 current=&1E00
200 old=&1900
        196 current=iE80
200 old=i990
210 start=±2900
210 start=±2900
210 start=±2900
210 addrata=±AA
240 neighbours=±70
250 temp=±AC
260 row=±AD
270 column=±AE
280 byte=±AF
290 writetos#71
300 temp2=£73
310 xco=£74
320 yco=£75
330 PRINT"Assembling..."
340 FOR pass=0 TO 2 STEP 2:P%=start
350 [OFT pass
360 JNF mainloop
370 .showcircuit
380 LDA #0
390 STA row
400 .displayrow
410 LDA row
420 ASL A
430 TAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1540 :
1550 .nextcolumn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1560 JMP storenewvalue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1560 JMP storenew
1570:
1580 .columnloop
1590 LDA #0
1600 STA byte
1610 LDA column
1620 LSR A:LSR A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2270 BEO wire3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2280 SEC $1
2290 SBC $1
2300 JMP store3
2310:
2320 .wire3
2320 .wire3
2330 JSR count
2340 LDA neighbours
2350 BEQ isawire3
2350 BCMP #3
2370 BCS inawire3
2380 LDA #3
2390 JMP store3
24400:
2410 .isawire3
2420 LDA #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              228Ø SEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1630 LSR A:LSR A
1630 TAY
1640 LDA (addrdata),Y
1650 BEQ nextcolumn
1670 JSR what
1680 CMP #0
1690 BEQ otorel
1700 CMP #1
1710 BEQ wirel
1730 SEC #1
1740 JMP storel
1750 :
                                                                                                                                                                                                                                                                                                          1028 RTS
1030:
1040 .plot
1055 LDA graphics,X
1058 STA (scraddr),Y
1078 INY
1088 LDA graphics+1,X
1099 STA (scraddr),Y
1108 INY
1110 LDA graphics+2,X
1128 STA (scraddr),Y
1138 INY
1140 LDA graphics+3,X
1158 STA (scraddr),Y
1168 RTS
1170:
                                                                                                                                                                                                                                                                                                               1020 RTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2410 .isawire3
2420 LDA #1
2430 .store3
2440 ASL A:ASL A
2450 CLC
2460 ADC byte
2470 STA byte
2480 LDY column
2490 LDY column
2500 JSR byat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1750 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1750 :
1760 .wirel
1770 JSR count
1780 LDA neighbours
1790 BEQ isawire
1800 CMP #3
1810 BCS isawire
1820 LDA #3
             430 TAX
        446 LDA addrtable,X
456 STA scraddr
466 LDA addrtable+1,X
478 STA scraddr+1
486 LDA datatable,X
490 STA addrdat
500 LDA datatable+1,X
510 CLC
520 ADC $5
530 STA addrdata+1
546 LDA $6
550 STA column
560 :
580 LDA (addrdata)
580 LDA (addrdata),Y
600 FHA
             440 LDA addrtable, X
                                                                                                                                                                                                                                                                                                          1168 RTS
1170:
1188 .mainloop
1199 JSR showcircuit
1200 LDA #current MOD 256
1218 STA scraddr
1220 LDA #current DIV 256
1230 STA scraddr+1
1240 LDA #old MOD 256
1250 STA addrdata
1260 LDA #old DIV 256
1279 STA addrdata+1
1280 LDX #0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1830 JMF storel
1840 : 1840 : 1850 .isawire
1860 LDA #1
1870 : 1880 .storel
1890 ASL A:ASL A
1910 ASL A:ASL A
1910 ASL A:ASL A
1910 ASL A:ASL A
1920 STA byte
1930 INC column
1940 LDY column
1950 JSR what
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1830 JMP store1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2500 JSR what
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2500 JSR what
2510 CMP #0
2520 BEQ store4
2530 CMP #1
2540 BEQ wire4
2550 SEC
2560 SBC #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2570 JMP store4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2570 JMP store4
2580 :
2590 .wire4
2600 JSR count
2610 LDA neighbours
2620 BEQ isawire4
             610 LSR A:LSR A
```



```
2630 CMP #3
2640 BCS isawire4
2650 LDA #3
2660 JMP store4
                                                                                                                                                                                                                     3770 :
                                                                                                                                                                                                                                                                                                                                                                                                                                         491Ø END
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1000 FOR loop=0 TO &4FF
                                                                                                                                                                                                                    3770 :
3780 .upleft
3790 LDA addrdata
3800 SEC
3810 SEC #20
3820 STA addrdata
3830 BCS skip2
3840 DEC addrdata+1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1010 b%=c%?loop
1020 c%?loop=(b% AND &55) OR (b% AND &A
                                                                                                                                                                                                                                                                                                                                                                                                                                    Listing 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1020 C%?loop=(D% AND &55) OR (D% AND &A ) DIV 2
1030 IF loop MOD 128=0 PRINTTAB(0,0);"R
mmoving ":9-(loop DIV 128)
1040 NEXT
1050 CALL &903
1060 ENDPROC
2650 JMP store4
2670:
2680 :Lsawire4
2590 LDA #1
2700 .store4
2710 CLC
2720 ADC byte
2739 STA byte
2740 .storenewalue
2750 LDA row
2750 ASL A
2770 TAX
2780 LDA datatable,X
2780 STA writeto
                                                                                                                                                                                                                                                                                                                                                                                                                                                 10 REM >WWorld8 (Info 2) - Circuit Au
                                                                                                                                                                                                                                                                                                                                                                                                                                     tomaton
20 REM By Andrew Pepperell
30 REM For B/B+/M/C/E
40 REM (C) BAU November 1991
                                                                                                                                                                                                                    3840 DEC addrddata

3850 : skip2

3870 LDA row

3880 BEQ downleft

3890 CPY #0

3900 BEQ up

3910 DEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1070 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1080 DEF PROCload
                                                                                                                                                                                                                                                                                                                                                                                                                                                 50:
60 IF PAGE<>£2300 THEN PAGE=£2300:CHA
"WMOrld8"
70:
80 MODE 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1898 fname$=FNfile
1190 IF fname$="" ENDPROC
1110 OSCLI("LOAD "+fname$+" "+STR$"C%)
1120 CALL &903
                                                                                                                                                                                                                   3910 DEY
3920 JSR what
3930 INY
3940 CHF #3
3950 BNE up
3960 INC neighbours
3970 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                    9Ø PROCC(Ø)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                113Ø ENDPROC
 2788 LDA datatable,X
2798 STA writeto
2800 LDA datatable+1,X
2810 ADC #5
2820 STA writeto+1
2830 LDA column
2840 LSR A:LSR A
2850 TAY
                                                                                                                                                                                                                                                                                                                                                                                                                                              90 PROCC(0)
100 PROCInit
110 PROCMENU
120 MODE 7
130 END
140:
150 DEF PROCINIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1140 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1150 DEF PROCEAVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1160 fname$=FNfile
1170 IF fname$="" ENDPROC
1180 OSCLI("SAVE "+fname$+" "+STR$"c%+"
                                                                                                                                                                                                                   3978 :
3988 up
3988 JSR what
4000 CMF #3
4018 BNE upright
4018 BNE upright
4028 INC neighbours
4030 :
4040 .upright
4050 CPF #79
4060 BEQ downleft
4070 INT
4088 JSR what
4090 DEY
4100 CMF #3
4110 BNE downleft
4128 INC neighbours
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 +500")
                                                                                                                                                                                                                                                                                                                                                                                                                                              180 BPF PROCEIDE
160 *PX 4,1
170 *FX 229,1
180 *Load Wwtcode 900
180 VDU 23,254,224,224,0,0,0,0,0
200 VDU 23,255,192,240,124,112,40,36,2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1190 ENDPROC
 2850 TAY
2860 LDA byte
2870 STA (writeto),Y
2880 INC column
2890 LDA column
2900 CMP #80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1200 :
1210 DEF FNfile
1220 COLOUR3
1230 PRINTCHR$30;SPC40;CHR$30;" Filenam
                                                                                                                                                                                                                                                                                                                                                                                                                                     ,1
210 VDU 19,1,4;0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          e:";
1240 PROCc(1)
  2910 BEQ nextrow
2920 JMP columnloop
                                                                                                                                                                                                                                                                                                                                                                                                                                           210 VDU 19,1,4;0;
220 VDU 19,2,2;0;
230 VDU 19,3,1;0;
240 c%=£1E00:0%=c%-£500
250 x=0;y=0
260 e05=CRR$27+CHR$27
270 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1250 COLOUR 2
1260 INPUT""file$
1270 PROCC(0)
1280 =file$
 2920 JMP columnlos
2930 :
2940 .nextrow
2950 IMC row
2960 LDA row
2970 CMP #64
2980 BEQ keyboard
2990 JMP rowloop
3000 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Listing 4
                                                                                                                                                                                                                     4120 INC neighbours
                                                                                                                                                                                                                                                                                                                                                                                                                                               280 :
                                                                                                                                                                                                                    4120 INC neighbours
4130 :
4140 .downleft
4150 LDA row
4160 CDF #63
4170 BEQ exitcount
4180 LDA addrdata
4190 CLC
4200 ADC #40
4210 STA addrdata
4220 BCC skip1
4230 INC addrdata+1
4240 :
                                                                                                                                                                                                                                                                                                                                                                                                                                              280 DEF PROCC(s)
300 VDU 23;10,95+s;0;0;0;0;
310 ENDPROC
320 :
330 DEF PROCMENU
  2990 JMP rowloop
3000 :
3010 .keyboard
3020 LDA #129
3030 LDX #256-113
3040 LDY #255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10 REM >Surface (Info 4)
20 REM By Paul McKenzie
30 REM For BBC B/B+/M/C/E/(A1)
40 REM (C) BAU November 1991
                                                                                                                                                                                                                                                                                                                                                                                                                                               340 held=FALSE
  3040 LDY #255
3050 JSR osbyte
3060 BCS exit
3070 JMP mainloop
3080 .exit
3090 LDY #0
                                                                                                                                                                                                                                                                                                                                                                                                                                    340 held=FALSE
350 REPEAT
360 COLOUR 3:COLOUR 129:PRINTTAB(0,0);
WirekOrld ""
370 COLOUR 128:PRINT" ";FNw("Edit");FN
W("Lodd");FNw("Save");FNw("Go");
380 IF held REPEATUNTILNOTINKEY-113:he
1d=FALSE:FXI5
390 key=INSTR(" Eells@gg"+ee$,GET$)DIV
2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60 MODE 2
70 PROCINIT
80 PROCIAW
90 END
100:
110 DEF PROCINIT
120 VDU 29,640;512;
130 VDU 23;10,32;0;0;0;
140 POR Colel TO 7
150 READ new
160 VDU 19,col,new;0;
170 NEXT
180 step=8
190 angle=30
200 CA=COSRAD(angle)
210 SASINRAD(angle)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60 MODE 2
 3098 LDY #8
3100:
3110:
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                                                                                                                                                                                                                    4230 INC addrd
4240 :
4250 .skip1
4260 CPY #0
4270 BBQ down
4280 DEY
4290 JSR what
4300 INY
4310 CMP #3
                                                                                                                                                                                                                                                                                                                                                                                                                                              400 IF key=1 PROCdesign
410 IF key=2 PROCload
420 IF key=3 PROCsave
430 IF key=4 CALL£900:held=TRUE
440 UNTIL key=5
                                                                                                                                                                                                                       4320 BNE down
                                                                                                                                                                                                                       4330 INC neighbours
                                                                                                                                                                                                                                                                                                                                                                                                                                                450 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                              450 ENDPROC
450 ::
470 DEF FNW(a$)
480 COLOUR 129:VDU 32
480 COLOUR 3:PRINTLEFT$(a$,1);
500 COLOUR 2:PRINTMID$(a$,2);"";
510 COLOUR 128
520 =""
530 :
540 DEP PROCCLESIGN
550 CALL 4903
560 REPENT
570 PROCCUTEOR
                                                                                                                                                                                                                     4330 TMC neighbours
4340 :
4350 .down
4360 JSR what
4370 CMP #3
4380 BME downright
4390 TMC neighbours
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    210 SA=SINRAD(angle)
220 ENDPROC
230 :
240 DATA 4,1,5,6,3,7,2
   324Ø RTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     250 :
260 DEF PROCdraw
  3240 kms
3250 .what
3270 STY temp
3280 TYA:TAX
3290 LSR A:LSR A
3300 TAY
3310 LDA (addrdata),Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 260 DEF PROCDIAW
270 GCOL 0,7
280 PROCDIOt(4,-500,-200,-500)
290 PROCDIOt(4,-500,-200,500)
300 PROCDIOt(85,500,-200,500)
310 PROCDIOt(85,500,-200,500)
310 YI=FNyy(-300,-300)
310 YI=FNyy(-300+step,-300)
310 YI=FNYY(-300+step,-300)
310 YI=FNYY(-300+step,-300)
310 YI=FNYY(-300+step,-300)
310 YI=FNYY(-300+step,-300)
310 YI=FNYY(X+step)
310 YI=FNYY(X+step,Z+step)
310 YI=FNYY(X+step,Z+step)
310 YI=FNYY(X+step,Z+step)
310 YI=GCO G-0
400 IF GCO G-0
400 IF GCO G-0
                                                                                                                                                                                                                     4400 :
4400 :
4410 .downright
4420 CPY #79
4430 BEQ exitcount
4440 INY
4450 JSR what
                                                                                                                                                                                                                                                                                                                                                                                                                                               570 PROCCURSOR
580 A%=INSTR(" ZzXx/?:*RrWwBb"+ee$,GET
                                                                                                                                                                                                                                                                                                                                                                                                                                  578 PROCCURSOT
580 Na=INSTR(" ZXX/?:*RrWwBb"+ee$,GE
$)DIV2
590 shift=INKEV-1
600 PROCCURSOT
610 IF shift=g=8 ELSE g=1
620 IF A%=1 xxx-q:IF xx0 x=0
630 IF A%=1 xxx-q:IF xx0 x=0
630 IF A%=3 y=y-q:IF yx6 y=0
640 IF A%=3 y=y-q:IF yx6 y=0
650 IF A%=4 y=y-q:IF yx6 y=0
660 IF A%=5 AND shift PROCCLear(x55)
680 IF INKEY(-30) PROCCLECT(x)
700 IF INKEY(-30 PROCCLECT(x)
710 IF INKEY(-36 PROCCLECT(x)
720 IF INKEY(-36 PROCCLECT(x)
730 UNTIL A%=8
740 ENDPROCC
750 I
   3320 PHA
3330 TXA
3340 AND #3
3350 STA temp2
3360 LDA #3
                                                                                                                                                                                                                        4460 DEY
                                                                                                                                                                                                                     4460 DEY
4470 CMF #3
4480 BNE exitcount
4490 INC neighbours
4500 :
4510 .exitcount
4520 PLA
4530 STA addrdata+1
4540 PLA
   3370 SEC
3380 SEC temp2
   3390 TAX
3400 PLA
3410 CPX #0
3420 BEQ and3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     488 IF G>6 G=6
410 GCCL g,G
420 PROCPLOt(4,X,Y2,Z+step)
430 PROCPLOt(4,X,Y1,Z)
440 PROCPLOt(85,X+step,Y4,Z+step)
450 PROCPLOt(85,X+step,Y3,Z)
                                                                                                                                                                                                                       4530 STA addrdata+1
4540 PLA
4550 STA addrdata
4560 LDA neighbours
4570 RTS
4580 :
   3430 .div4
3440 LSR A:LSR A
                                                                                                                                                                                                                       4580 :
4590 :graphics
4600 EQUD £00000000
4610 EQUD £000E0E0E
4620 EQUD £00EEEEEE
4640 :
4650 .addrtable
   3450 DEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      460 GCOL 0,1
470 PROCPlot(4,X-100,Y2-300,Z-100+step
   3450 DEX
3460 BNE div4
3470 :
3480 .and3
3490 AND #3
3500 LDY temp
3510 RTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480 PROCplot(4,X-100,Y1-300,Z-100)
490 PROCplot(85,X-100+step,Y4-300,Z-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0+step)
500 PROCplot(85,X-100+step,Y3-300,Z-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                750 :
760 DEF PROCalter(a)
 3510 RTS
3520 .count
3530 LDA addrdata
3540 PHA
3550 LDA addrdata+1
3550 PHA
3570 LDA #0
3580 STA neighbours
3590 CPY #3
3600 Beg right
3610 DEY
3620 JSR what
3630 INY
3640 CMP #3
3650 BHE right
3660 INC neighbours
3670 :
                                                                                                                                                                                                                                                                                                                                                                                                                                    760 DEF PROCALER(a)
770 byte=c%+y*20+x DIV 4
780 poss3-(x AND 3)
790 7byte=?byte AND 255-(2^(2*pos)+2^(
2*pos+1))
800 7byte=?byte+a*(2^(2*pos))
810 GCOL 0,a
820 MOVE x*16,(64-y)*16-4
830 VDU 5,254,4
840 EMDPROC
850 .
                                                                                                                                                                                                                    4650 | Addrtable
4660 | 4670 FOR loop=0 TO 31
4680 [OFT pass
4690 EQUW &3000+loop*640
4700 EQUW &3000+loop*640+4
4710 | 4720 NEXT
4730 datatable=P%
4740 FOR loop=0 TO 63
4750 [OFT pass
4760 EQUW old+loop*20
4770 |
4780 NEXT
4790 NEXT
4800 ENDPROC
4810 :
                                                                                                                                                                                                                        4660 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  )
510 Y1=Y2
520 Y3=Y4
530 NEXT
540 NEXT
550 ENDERGC
560 :
570 DEF PROCPLOt(X%, X%, Y%, Z%)
580 x%=CA*X%-SA*Z%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  570 DEF PROCDIOL(K%, X'
580 X%=CA*X%=SA*X$
590 Z%=Z%
600 Z%=Z%
610 Y%=CA*Y%=SA*Z%
620 Z%=SA*Y%+CA*Z%
630 M=-2000/(Z%-2000)
640 PLOT K%, X*M, Y%*M
650 ENDPROC
660 :
                                                                                                                                                                                                                                                                                                                                                                                                                                               840 EMDEROC
850:
860 DEF PROCcursor
870 MOVE x*16+4,(63-y)*16+8
880 VDU 5,18,4,0,255,4
890 EMDEROC
                                                                                                                                                                                                                                                                                                                                                                                                                                    900 :
910 DEF PROCClear(byte)
920 word=byte OR byte*256 OR byte*256*
256 OR byte*256*256*256
930 FOR loop=0 TO &4FC STEP 4
940 C*lloop=word
950 NEXT
960 IF word>0 CALL &903 ELSE VDU 26,12
970 ENDPROC
980 :
                                                                                                                                                                                                                         4810 :
   3680 .right
3690 CPY #79
3700 BEQ upleft
3710 INY
3720 JSR what
3730 DEY
3740 CMP #3
3750 BNE upleft
                                                                                                                                                                                                                         4820 DEF PROCchecksum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      660 :
670 DEF FNgy(X,Z)
                                                                                                                                                                                                                        4830 PRINT"Checking..."
                                                                                                                                                                                                                       4830 PRINT'Checking..."
4840 T%=0
4850 FOR M%=start TO P%-1
4860 I%=I%+7M%
4870 HEXT
4880 IF I%=99899 THEN ENDPROC
4890 VDI 7
4900 PRINT "Checksum error"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     680 x=X/50
690 z=Z/50
700 =COS(2.5*SQR(x*x+z*z))*50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Listing 5
      3750 BNE upleft
3760 INC neighbours
                                                                                                                                                                                                                                                                                                                                                                                                                                                990 DEF PROCremove
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10 REM >LASTC (Info 5)
```

```
20 REM ListAid module source
30 REM by Dave Acton
40 REM for Archimedes only
50 REM (c) BAU November 1991
60:
                                                                                                                                                                                                                                       3360
3370
3380
                                                                             1150
1160
1170
1180
1190
                                                                                                                                                                                                                                                             BL
MOV
                                                                                                                                                                                                                                                                           evaluate
                                                                                                                                                                                                                                                                          r2, r0
                                                                                                                                                                               FNtext("No room in RMA")
                                                                                                                                                                                                                                                                           write_line
                                                                                                   EQUE
                                                                                                                                                          2290
                                                                                                                                                                                                                                        3390
                                                                                                                                                                                                                                                             BL
                                                                                                                                                                                                                                                                          rø,#10
"XOS_BPut"
                                                                                                   EQUE
                                                                                                                                                          2300
                                                                                                                                                                                                                                        3400
                                                                                                                                                                                                                                                             MOV
    70 DIM code 4000
                                                                             1200
                                                                                                                                                          2310
                                                                                                                                                                  .ListSet
                                                                                                                                                                                                                                        3410
                                                                                                                                                                                                                                                             SWI
                                                                             1210
                                                                                                   ALIGN
                                                                                                                                                          2320
                                                                                                                                                                               CMP
   90 wp
                     =12
                                                                                                                                                                                            pc,link
(sp)!,{r1-r11,link
                                                                             1220
 100 sp
110 link
120 pc
                     =13
=14
=15
                                                                                                                                                                               STMFD
                                                                                                                255
                                                                                                                                                                                                                                                              CMP
                                                                                                                                                                                                                                                                          rø, #ASC
                                                                                                                                                                                                                                       3450
                                                                                                                                                                                                                                                             BEQ
                                                                                                                                                                                                                                                                          save_par_loop
                                                                                                                8
255
                                                                                                                                                          2350
                                                                                                                                                                                             init com
                                                                                                   EQUE
                                                                                                                                                                                                                                       3460
                                                                                                                                                                                                                                                             CMP
                                                                                                                                                                                                                                                                           rø, #0
                                                                                                                                                                               ADR r0,parlist
ADD r1,wp,#command
ADD r2,wp,#work
MOV r3,#256
SWI "XOS_ReadArgs"
LDMVSFD (ap)1,(r1-r11,pc)
MOV r9,#0
                                                                                                                                                                                                                                                                          find_next_to_save
save_headers
rØ,#Ø
"XOS_Find"
                                                                             1260
                                                                                                   EQUB
                                                                                                                20
                                                                                                                                                          2360
                                                                                                                                                                                                                                       3470
                                                                                                                                                                                                                                                             BNE
 140 alloc
                                                                                                                253
                                                                             1270
                                                                                                   EOUE
                                                                                                                                                          2370
                                                                                                                                                                                                                                       3480
                                                                                                                                                                                                                                                             BL
MOV
SWI
ADD
MOV
                                                                                                                                                                                                                                       3490
3500
3510
  150 balance =FNalloc(1)
                                                                             1280
 160 columns =FNalloc(1)
170 eject =FNalloc(1)
180 gutter =FNalloc(1)
190 length =FNalloc(1)
                                                                             1290
1300
1310
                                                                                                                                                                                                                                                                          r1, wp, #command
                                                                                                                                                                                                                                       3520
                                                                             1320
                                                                                                   EQUE
                                                                                                                                                          2420
                                                                                                                                                                                                                                       3530
                                                                                                                                                                                                                                                             MOV
                                                                                                                                                                                                                                                                           r2. #&EB
 200 size
                     =FNalloc(1)
                                                                             1330
                                                                                                   EQUE
                                                                                                                                                          2430
                                                                                                                                                                               ADD
                                                                                                                                                                                            r8, wp, #work
                                                                                                                                                                                                                                        3540
                                                                                                                                                                                                                                                             ORR
                                                                                                                                                                                                                                                                           r2, r2, #&FØØ
"XOS File"
 210 width
                     =FNalloc(1)
                                                                             1340
                                                                                                                253
                                                                                                                                                          2440
                                                                                                                                                                                            r7,[r8],#4
r7,#0
next_par
r0,[r7]
r0,r0,#&DF
 220 tmarg
                     =FNalloc(1)
                                                                             1350
                                                                                                   ALIGN
                                                                                                                                                                                                                                                                           (sp)!, {r1-r11,pc}
 230 hmarg
240 fmarg
250 bmarg
260 lmarg
                     =FNalloc(1)
=FNalloc(1)
=FNalloc(1)
=FNalloc(1)
                                                                                                               (sp)!,(link)
rØ,#release
r2,[wp]
"XOS_Module"
                                                                                                                                                                                                                                                .par_list
                                                                                                   MOV
LDR
                                                                                                                                                                                                                                       3590
                                                                                                                                                                                                                                                                          "Columns/k,"
"Eject/k,"
"Gutter/k,"
"Length/k,"
                                                                             1390
                                                                                                                                                          2490
                                                                                                                                                                               AND
                                                                                                                                                                                                                                       3600
                                                                                                                                                                                                                                                             EQUS
                                                                                                                                                                                            r0,r0,#&Dr
r0,#ASC"Y"
r2,#255
set_value
r0,#ASC"N"
r2,#254
 270 lengths
                    =FNalloc(3)
                                                                             1400
                                                                                                   SWI
                                                                                                                                                          2500
                                                                                                                                                                               CMP
                                                                                                                                                                                                                                       3610
                                                                                                                                                                                                                                                             EOUS
                                                                                                                                                                                                                                                             EQUS
EQUS
EQUS
 280 pageno
290 last
                    =FNalloc(1)
                                                                             1410
                                                                                                   LDMFD
                                                                                                                (sp) 1, (pc)
                                                                                                                                                          2510
                                                                                                                                                                               MOVEQ
                                                                                                                                                                                                                                       3620
 290 last =FNalloc(1)
300 alloc =(alloc+3) AND (NOT 3)
310 work =FNalloc(256)
320 command =FNalloc(256)
                                                                             1420
                                                                                                                                                                                                                                                                           "ColumnSize/k,"
"Width/k,"
                                                                             1440
                                                                                                                (sp)!, {r1-r11, link
                                                                                                                                                                               MOVEQ
                                                                                                                                                                                                                                       3650
                                                                                                                                                                                                                                                             EQUE
                                                                                                                                                                                                                                                                           "TopMargin/k,
                                                                                                                                                          2550
                                                                                                                                                                               BEQ
                                                                                                                                                                                            set_value
                                                                                                                                                                                                                                       3660
                                                                                                                                                                                                                                                             EQUE
                                                                             1450
                                                                                                                                                                                                                                                             EQUS
EQUS
EQUS
EQUS
                                                                                                                                                                                                                                                                           "HeaderMargin/k,"
"FooterMargin/k,"
"BottomMargin/k,"
"LeftMargin/k"
 330 headers =alloc
                                                                                                                init com
                                                                                                                                                          2560
                                                                                                                                                                               MOV
                                                                                                                                                                                             rø. #10
                                                                                                                                                                                                                                        3670
                    =FNalloc(256)
                                                                                                               r5,par_list
r3,wp
 340 setup
350 header
                                                                             1460
                                                                                                   ADR
                                                                                                                                                                                                                                        3680
                                                                                                                                                                                                                                       3690
3700
3710
                    =FNalloc(256)
=FNalloc(256)
                    =(alloc+15) AND (NOT 15)
                                                                                                                                                                                                                                                             EQUB
                                                                                                                                                                                            r1, minima
                                                                                                                                                                                                                                       3720
                                                                                                                                                                                                                                                             ALIGN
                     =12
=255
                                                                                                               r0,[r5],#1
r0,#ASC"/"
                                                                             1510
                                                                                                   LDRB
                                                                                                                                                          2620
                                                                                                                                                                               LDRB
                                                                                                                                                                                            rø,[r1,r9]
                                                                                                                                                                                                                                       3730
                                                                                                                                                                                            r2,r0
bad_val
r1,maxima
r0,[r1,r9]
 400 true
                                                                             1520
                                                                                                   CMP
                                                                                                                                                          2630
                                                                                                                                                                               CMP
                                                                                                                                                                                                                                       3740 .obey_header
                                                                                                                                                                                                                                       3750 FNtext("RMEnsure ListAid Ø
ListAid"+CHR$10)
                                                                                                                done_par_name
"XOS_WriteC"
 410 false
                    =254
                                                                             1530
                                                                                                   BEQ
                                                                                                                                                          2640
                                                                                                                                                         2650
2660
2670
 420 claim
                                                                             1540
 430 release =7
440 vbt =1<<28
450 crlf$ =CHR$10+CHR$13
460 syntax$ =CHR$27+CHR$1+"
                                                                                                               r4,r4,#1
list_par_loop2
                                                                                                                                                                                                                                       3760
3770 .set_command
                                                                                                                                                                                            r2,r0
bad_val
r2,[wp,r9]
r9,#1
                                                                                                                                                                                                                                                            FNtext("ListSet -")
                                                                                                                                                          2680
                                                                                                                                                                                                                                       3780
                                                                                                                rø, r4, #16
                                                                             1580
                                                                                                  RSB
                                                                                                                                                          2690
                                                                                                                                                                               STRB
                                                                                                                                                                                                                                       3790
                                                                                                               r0, r4,#10
several
r0, [r3],#1
evaluate
"XOS_Write0"
"XOS_NewLine'
                                                                             1590
                                                                                                                                                                               CMP
                                                                                                                                                                                                                                       3800 .Listing
 480 FOR pass=4 TO 6 STEP 2
                                                                             1600
                                                                                                   LDRB
                                                                                                                                                                               CMPNE
                                                                                                                                                                                                                                       3810
                                                                                                                                                                                                                                                             STMFD
                                                                                                                                                                                                                                                                         (sp)!, (r1-r11, link
 490 P%=0
500 O%=code
510 [OPT pass
520 .listaid
                                                                             1610
                                                                                                                                                                                            dont_set_col_width
r3,[wp,#columns]
                                                                                                                                                                               BNE
LDRB
                                                                                                                                                                                                                                                                          init_com
r0,[wp,#columns]
r1,[wp,#length]
r8,r0,r1
r0,[wp,#size]
r3,r0,r8
r0,#claim
"XOS_Module"
r0,no room
                                                                                                                                                                                                                                       3830
                                                                             1640
                                                                                      .skip_par_nameloop
LDRB r0,[r5],#1
                                                                                                                                                                               SUB
                                                                                                                                                                                             rØ, r3, #1
                                                                                                                                                                                                                                       3840
                                                                                                                                                                                                                                                             LDRB
                                                                                                                                                                                            r0, r3, #1
r1, [wp, #gutter]
r0, r1, r0
r1, [wp, #width]
r0, r1, r0
r2, #0
 530
                                                                             1650
                                                                                                                                                          2760
                                                                                                                                                                               LDRB
                                                                                                                                                                                                                                       3850
                                                                                                                                                                                                                                                             MUL
 540
                     EOUD
                                  init
                                                                             1660
                                                                                                  CMP
                                                                                                                                                                                                                                       3860
                                                                                                                                                                                                                                                             I.DRR
                                                                                                  BEQ
CMP
BNE
MOV
                                                                                                                list_par_loop
r0,#0
skip_par_nameloop
 550
                     EOUD
                                  quit
                                                                             1670
                                                                                                                                                                               LDRR
                                                                                                                                                                                                                                       3870
                     EQUD
EQUD
EQUD
EQUD
                                                                             1680
1690
1700
1710
 560
 57Ø
58Ø
59Ø
                                  la_title
la_help
                                                                                                                                                                  .divide
                                                                                                                                                                                                                                                             ADRVS
                                                                                                                                                                                                                                       3900
                                                                                                                                                                                                                                                                          rø, no room
                                                                                                                r7,string_names
                                                                                                                                                                               SUBS
                                                                                                                                                                                                                                                                          (sp)!, {r1-r11,pc}
r11,r2
r9,#0
                                  la_commands
                                                                                                   ADR
                                                                                                                                                          2820
                                                                                                                                                                                            rø, rø, r3
                                                                                                                                                                                                                                       3910
                                                                                                                                                                                                                                                             LDMVSFD
                                                                                                                                                                                                                                                            MOV
MOV
MOV
 600
                     EQUD
                                                                                                   ADD
                                                                                                                r8, wp, #lengths
                                                                                                                                                         2830
                                                                                                                                                                               ADDPL
                                                                                                                                                                                            r2,r2,#1
divide
                                                                                                                                                                                                                                       3920
 610
                     EOUD
                                                                             1730
                                                                                               string
                                                                                                                                                          2840
                                                                                                                                                                               BPL
                                                                                                                                                                                                                                       3930
                                                                                                           loop
r0,r7
                                                                                                  MOV
MOV
SWI
ADD
                                                                                                                                                                                                                                                                          r10,#0
r10,#0
r7,r11
r9,[wp,#last]
r0,#1
 620
 630
                                                                                                                                                                                            r2, [wp, #size]
                                                                                                                                                                               STRB
                                                                                                                                                                                                                                       3960
                                                                                                                                                                                                                                                             STRE
        .la_title
                                                                                                                                                                                            next_par
                                                                                                                r5, wp, #headers
                                                                                                                                                          2880
                                                                                                                                                                                                                                       3970
                                                                                                                                                                                                                                                             MOV
                     FNtext ("ListAid")
 660
                                                                             1780
                                                                                                   ADD
                                                                                                                r5,r5,r6,ASL #8
r7,r7,#9
                                                                                                                                                          2890
                                                                                                                                                                  .dont set col
                                                                                                                                                                                        width
                                                                                                                                                                                                                                       3980
                                                                                                                                                                                                                                                             STRB
                                                                                                                                                                                                                                                                          r0, [wp, #pageno]
r0, #&40
                                                                                                                                                                                                                                                             MOV
ADD
SWI
BVS
                                                                                                                                                                                            r9,#5
 670
                                                                             1790
                                                                                                   ADD
                                                                                                                                                          2900
                                                                                                                                                                                                                                       3990
                                                                                                                                                         2910
2920
2930
2940
                                                                                                                                                                                            next_par
rØ,[wp,#columns]
r1,[wp,#gutter]
r3,r1,r2
 680
                                                                                                   LDRR
                                                                                                               r4, [r8],#1
                     EQUS
EQUB
EQUB
                                                                                                                                                                               LDRB
LDRB
ADD
                                  "ListAid
                                                                             1810
                                                                                                                r4,r4,#1
                                                                                                                                                                                                                                                                           list_err
                                                                                                               shown_string
r0,[r5],#1
r0,#32
                                                                                                                                                                                                                                                                          rø,#ø
                                                                                                                                                                                                                                       4030
                                                                                                                                                                                                                                                             CMP
                                                                                                                                                                                                                                                                          rø, no_such_file
                                                                             1840
                                                                                                  LDRB
                                                                                                                                                          2950
                                                                                                                                                                               MUL
                                                                                                                                                                                            r3, r0, r3
                                                                                                                                                                                                                                       4040
                                                                                                                                                                                                                                                             ADREO
                                                                                                                                                                                                                                                                          r0,no_such_file
list_err
(sp)!,(r0)
r0,wp,#setup
r1,[wp,#lengths]
"XOS_WriteN"
                                   " ("+MID$ (TIME$, 5,
 730
                     EQUS
                                                                             1850
                                                                                                  CMP
                                                                                                                                                          2960
                                                                                                                                                                                                                                       4050
                                                                                                                                                                                                                                                             BEO
                                                                             1860
                                                                                                   BLT
                                                                                                                                                                               STRB
                                                                                                                                                                                            r3, [wp, #width]
                                                                                                                                                                                                                                       4060
                                                                                                                                                                                                                                                             STMFD
                                                                                                                                                                                                                                                             ADD
LDRB
 740
                     EQUB
                                                                             1870
                                                                                                   CMP
                                                                                                                rø,#12
                                                                                                                                                         2990
3000
3010
                                                                                                                                                                               ADD
                                                                                                                                                                                            r9,r9,#1
r9,#pars
        init
                                  (sp)!, {link}
                                                                                                                                                                                                                                                             LDMFD
                                                                                                                show_string
                                                                                                                                                                                            decode_args
(sp)!, {r1-r11,pc}
                                                                                                                                                                                                                                                                          (sp)!, (r1)
                                  rØ, #claim
                                                                                                                                                                               LDMFD
                     MOV
                                                                             1910
                                                                                                                                                          3020
                                                                                                                                                                                                                                       4110
                                                                                                                                                                                                                                               .list_loop
 790
                                  r3, #alloc
                                                                             1920
                                                                                                  SWI
                                                                                                                &20100+ASC"["
                                                                                                                                                          3030
                                                                                                                                                                  .bad val
                                                                                                                                                                                                                                       4120
                                                                                                                                                                                                                                                            SWI
                                                                                                                                                                                                                                                                          "XOS ReadEscapeSta
                                                                                                                r1, wp, #work
r2, #256
"XOS_ConvertCardin
                                                                                                                                                                                                                                     te"
4130
4140
 800
                     SWI
                                   "XOS Module
                                                                             1930
                                                                                                  ADD
                                                                                                                                                          3040
                                                                                                                                                                               LDMFD
                                                                                                                                                                                            (sp)!, (r1-r11, link
                                  rØ, no_room
(sp)!, {pc}
r2, [wp]
 810
                     ADRVS
                                                                             1940
1950
                                                                                                                                                                                                                                                            ADRCS
BCS
SWI
 820
830
840
850
                     LDMVSFD
STR
                                                                                                                                                         3050
3060
                                                                                                                                                                              ADR
ORRS
                                                                                                                                                                                            rØ,bad_val_err
pc,link,#vbit
                                                                                                                                                                                                                                                                           list_err
"XOS_BGet"
                                                                            1960
1970
                                                                                                  SWI
                                                                                                                "XOS_Write@"
                                                                                                                                                          3070
                                                                                                                                                                                                                                       4160
                                                                                                                                                                                                                                                             BVS
                                                                                                                                                                                                                                                                          list_err
listed
                     LDMIA
                                                                                                                &20100+ASC"]
                                  (3), {r4-r7}
(2), {r4-r7}
                                                                                                  SWI
                                                                                                                                                          3080
                                                                                                                                                                 .bad val err
                                                                                                                                                                                                                                       4170
                                                                                                                                                                                                                                                             BCS
 860
                     STMIA
                                                                             1980
                                                                                                                show string
                                                                                                                                                          3090
                                                                                                                                                                               EOUD
                                                                                                                                                                                                                                                                                    char
 870
                     LDMFD
                                  (sp)!, (pc)
                                                                             1990
                                                                                                 string
                                                                                                                                                         3100
                                                                                                                                                                               FNtext("Invalid parameter"
                                                                                                  SWI
ADD
CMP
                                                                                                               "XOS_NewLine"
r6,r6,#1
r6,#3
                    values
 900
910
                                  255
                                                                                                                                                                                                                                       4220
                                                                                                                                                                                                                                                             MOVNE
                                                                                                                                                                                                                                                                          rØ, #13
                                                                                                                show_string_loop
                                                                                                                                                                              STMFD
                                                                                                                                                                                            (sp)!, (r1-r11, link
                     EQUB
                                                                                                                                                         3130
                                                                             2030
                                                                                                                                                                                                                                       4230
                                                                                                                                                                                                                                                             BLNE
                                                                                                                                                                                                                                                                          write char
                                  255
 920
                     EQUB
                                                                             2040
                                                                                                  LDMFD
                                                                                                                (sp) | , (r1-r11, pc)
                                                                                                                                                                                                                                       4240
                                                                                                                                                                                                                                                             BL
                                                                                                                                                                                                                                                                          show_page
r0,#0
                                                                                                                                                          3140
 930
                     EQUB
                                                                             2050
                                                                                                                                                                                            init com
                                                                                                                                                                                                                                       4250
                                                                                                                                                                                                                                                             MOV
                     EQUB
EQUB
EQUB
EQUB
EQUB
                                                                                                                                                         3150
3160
3170
3180
                                                                                                                                                                                            r0,#&80
r1,wp,#command
"XOS_Find"
(sp)!,{r1-r11,pc}
                                                                                                                                                                                                                                       4260
4270
4280
4290
 940
                                                                             2060
                                                                                      evaluate
                                                                                                                                                                                                                                                                          "XOS_Find"
r0, #release
                                                                            2070
2080
2090
2100
2110
                                                                                              STMPD
CMP r0,n
ADREQ r0,no
ADRET r0,yos
LDMGEFD (sp)1,(r1,pc)
ADD r1,yp,#work
r2,#32
#XOS_CONVERT
                                                                                                               (sp)!, {r1,link}
r0,#254
r0,no
 950
960
970
980
990
                                   (80-6) DIV 3
                                                                                                   STMFD
                                                                                                                                                                                                                                                                           'XOS_Module
                                                                                                                                                          3190
                                                                                                                                                                                            r1,r0
                                                                                                                                                                                                                                       4300
                                                                                                                                                                                                                                                             LDMFD
                                                                                                                                                                                                                                                                          (sp)!, (r1-r11,pc)
                                                                                                                                                                                            r2, obey_header
                                                                                                                                                          3200
                                                                                                                                                                               ADR
                                                                                                                                                                                                                                       4310
                                                                                                                                                                                            write_line_star
r5,par_list
r3,wp
                                                                                                                                                                                                                                                                          (sp)!,(r0)
r0,#0
"XOS_Find"
r0,#release
1000
                     EQUE
                                                                             2120
                                                                                                                                                          3210
                                                                                                                                                                                                                                       4320
                                                                                                                                                                                                                                                             STMFD
                                                                                                                                                                                                                                                            MOV
SWI
MOV
MOV
1010
                     EQUB
                                                                             2130
                                                                                                                                                          3220
                                                                                                                                                                               ADR
                                                                                                                                                                                                                                       4330
1020
                     EQUB
                                                                            2140
                                                                                                                "XOS ConvertCardin
                                                                                                                                                          3240
3250
3250
3260
1030
                                                                            215Ø
216Ø
                                                                                                  LDMFD
                                                                                                                                                                                            r2,set_command
write_line_star
                                                                                                                                                                                                                                                                           'XOS_Module
                                                                                                                                                                                                                                       4370
                                                                                      show_par_val
                                                                                                                                                                         e_par_loop2
                                                                                                                                                                                                                                       4380
                                                                                                                                                                                                                                                            LDMFD
                                                                                                                                                                                                                                                                          (sp)!, (r0, r1-r11, l
                                                                                                                                                                                            rø,[r5],#1
                                                                             218Ø
                                                                                     .yes
                                                                                                  FNtext
                                                                                                                                                          3280
                                                                                                                                                                               LDRB
                                                                                                                                                                                                                                     ink)
                                                                             2190
                                                                                     .no
                                                                                                  FNtext("N")
                                                                                                                                                          3290
                                                                                                                                                                               CMP
                                                                                                                                                                                            rø, #ASC"/
                                                                                                                                                                                                                                       4390
                                                                                                                                                                                                                                                            ORRS
                                                                                                                                                                                                                                                                         pc, link, #vbit
1090
                     EQUB
                                  254
                                                                                                                                                          3300
                                                                                                                                                                               BEO
                                                                                                                                                                                             saved_par_name
"XOS_BPut"
                                                                                                                                                                                                                                       4400
1100
                     EOUB
                                                                             2210
                                                                                                                                                          3310
                                                                                                                                                                               SWI
                                                                                                                                                                                                                                       4410
                     EQUB
EQUB
EQUB
                                                                                                                "Setup : "
"Header : "
"Footer : "
1110
                                  254
                                                                             2220
                                                                                                                                                                                             save_par_loop2
                                                                            2230
2240
2250
                                                                                                                                                                                                                                                            FNtext ("Escape")
                                                                                                                                                                                            rØ,#32
"XOS_BPut
                                                                                                                                                                                                                                       4450 .write_char
```

# PAGES YELLOW

| 4460<br>4470  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|
| 4470  | CMP  | rØ,#32   | 5570   |  |  | 6630   |  | r0,#ASC"""   |  | istHeader_Help   |
|   | BGE  | normal_char  |  | .head_foot   | to the second second   | 6640   |  | rø,[r8],#1   | 7540   | EQUS "*ListHeader sets   |
| 4480  | CMP  | rØ,#10   | 5590   | STMFD  | (sp)!, {r1-r11, link   | 6650   |  | get_string   |  | ional) header string. "  |
| 4490  | CMPNE  | r0,#13   | }  |  |  | 6660   |  | rØ, [r6],#1  | 7550   | EQUS crlf\$  |
| 4500  | MOVNE  | pc,link  | 5600   | MOV  | r11,r0   | 6670   | CMP  | r0,#ASC"""   |  | istHeader_Syntax   |
| 4510<br>4520  | LDRB<br>CMP  | r2, [wp, #last]<br>r2, #10   | 5610<br>5620   | LDRB<br>ADD  | rØ, [wp, #pageno]  | 668Ø<br>669Ø   |  | rØ,[r8],#1   | 757Ø<br>758Ø   | FNtext(syntax\$+" <string>")</string>  |
| 4530  | CMPNE  | r2,#13   | 5630   | MOV  | r1,wp,#command<br>r2,#256  | 6700   |  | get_string<br>r6,r6,#1   |  | istFooter_Help   |
| 4540  | BNE  | wasnt_cr_or_lf   | 5640   | SWI  | "XOS_ConvertCardin   | 6710   |  | read setup   | 7600   | EQUS "*ListFooter sets   |
| 4550  | CMP  | r2, r0   | a12"   | 5112   | NOD_CONVERCEMENT   | 6720 .got_s  |  | read_secup   |  | ional) footer string. "  |
| 4560  | MOVNE  | pc,link  | 5650   | STMFD  | (sp)!, {r1}  | 6730   |  | r8,r8,wp   | 7610   | EQUS crlf\$  |
| 4570  | .wasnt_cr_or_lf  |  | 5660   | ADD  | r1,wp,#work  | 6740   |  | r8,r8,#setup   |  | istFooter_Syntax   |
| 4580  | STRB   | r0, [wp, #last]  | 5670   | MOV  | rø,#3  | 6750   | STRB   | r8,[r9,r4]   | 7630   | FNtext(syntax\$+" <string>")</string>  |
| 4590  | MOV  | rØ,#32   | 5680   | STRB   | rø, [r1]   | 6760   | LDMFD  | (sp)!, {r1-r11,pc}   | 7640   |  |
| 4600  | LDRB   | r2, [wp, #size]  | 5690   | MOV  | rØ,#14   | 6770 .bad_s  |  |  |  | istPars_Help   |
|   | .pad_line  | ( A1   | 5700   | SWI  | "XOS_Word"   | 6780   | MOV  | r0,#0  | 7660   | EQUS "*ListPars display  |
| 4620<br>4630  | STRB<br>ADD  | r0, [r7],#1<br>r9,r9,#1  | 5710<br>5720   | LDMFD  | (sp)!, {r1}  | 679Ø<br>68ØØ   | STRB   | rØ, [r9, r4]   |  | rrent ListAid parameters."   |
| 4640  | CMP  | r9,r2  | 5730   | STRB   | rØ, #32<br>rØ, [r1], #1  | 6810   | ADR<br>LDMFD   | rØ, setup_err<br>(sp)!, (r1-r11, link  | 7670   | EQUS crlf\$<br>istPars_Syntax  |
| 4650  | BNE  | pad_line   | 5740   | ADD  | rø,wp,#work  | 1 0010   | DDMFD  | (bp):,(11-111,1111K  | 7690   | FNtext(syntax\$)   |
| 4660  | В  | newline  | 5750   | MOV  | r2,#256  | 6820   | ORRS   | pc,link,#vbit  | 7700   | Incoxe (byneaxy)   |
|   | .normal_char   |  | 5760   | ADR  | r3,time_format   | 6830   |  |  |  | istSave_Help   |
| 4680  | STRB   | rØ,[r7],#1   | 5770   | SWI  | "XOS_ConvertDateAn   | 6840 .setup  | err  |  | 7720   | EQUS "*ListSave saves t  |
| 4690  | STRB   | rØ, [wp, #last]  | dTime"   |  |  | 6850   | EQUD   | 0  | he curre   | nt ListAid parameters as an "  |
| 4700  | ADD  | r9, r9, #1   | 5780   | ADD  | rø, wp, #command   | 6860   | FNtext(*   | 'Bad string")  | 7730   | EQUS "obey file."  |
| 4710  | LDRB   | rØ, [wp, #size]  | 5790   | ORR  | r0, r0, #1<<31   | 687Ø   |  |  | 7740   | EQUS crlf\$  |
| 4720  | CMP  | r9,r0  | 5800   | ADD  | rl,wp,#work  |  | _line_star   |  |  | istSave_Syntax   |
| 4730  | MOVLT  | pc,link  | 5810   | MOV  | r2,#256  | 6890   | STMFD  | (sp)!,{link}   | 7760   | FNtext(syntax\$+" <filename></filename>  |
| 4750  | .newline<br>MOV  | r9,#Ø  | 5820<br>5830   | ADD<br>ADD   | r3, wp, #headers   | 6900<br>6910   | MOV<br>B   | rØ, #ASC"*"  | ")<br>7770   |  |
| 4760  | ADD  | r10, r10, #1   | 5840   | ADD  | r3,r3,r11,ASL #8<br>r4,wp,#lengths   | 6920 .write  |  | write_line_bput  |  | ave_headers  |
| 4770  | CMP  | r10, r8  | 5850   | LDRB   | r4, [r4, r11]  | 6930   | STMFD  | (sp)!, (link)  | 7790   | STMFD (sp)!, (link)  |
| 4780  | MOVLT  | pc,link  | 5860   | SWI  | "XOS_SubstituteArg   |  | line_loop  |  | 7800   | ADR r2,com1  |
| 4790  | .show_page   |  | 8"   |  |  | 6950   | LDRB   | rø,[r2],#1   | 7810   | MOV r3,#0  |
| 4800  | СМР  | r7,r11   | 5870   | LDRB   | rØ,[wp,#width]   | 6960   | CMP  | rø,#0  | 7820   | BL write_head_foot   |
| 4810  | MOVEQ  | pc,link  | 5880   | SUB  | rØ, rØ, r2   | 6970   | LDMEQFD  | (sp)!, {pc}  | 7830   | ADR r2,com2  |
| 4820  | STMFD  | (sp)!, (r2-r9, link)   | 5890   | MOV  | rø, rø, ASR #1   |  | e_line_bput  |  | 7840   | MOV r3,#1  |
| 4830  | LDRB   | r0, [wp, #tmarg]   | 5900   | BL   | several  | 6990   | SWI  | "XOS_BPut"   | 7850   | BL write_head_foot   |
| 484Ø<br>485Ø  | BL   | margin   | 5910   | ADD  | rØ,wp,#work  | 7000   | В  | write_line_loop  | 7860   | ADR r2,com3  |
| 4860  | BL   | r0,#1  | 592Ø<br>593Ø   | SWI  | "XOS_Write0"   | 7010   |  |  | 7870   | MOV r3,#2  |
| 4870  | LDRB   | head_foot<br>rØ,[wp,#hmarg]  | 5940   | LDMFD  | (sp)!, {r1-r11,pc}   | 7020 .write<br>7030  | e_return<br>STMFD  | (sp)!, (link)  | 788Ø<br>789Ø   | BL write_head_foot<br>LDMFD (sp)!,(pc)   |
| 4880  | BL   | margin   |  | .time_format   |  | 7040   | MOV  | r0,#10   | 7900   | LDMFD (sp)!, {pc}  |
| 4890  | MOV  | r4,#0 ;  | 5960   |  | "%24:%mi.%se %dy-%m  | 7050   | SWI  | "XOS BPut"   |  | rite_head_foot   |
|   | ed line number   |  | 3-%ce%   |  | sarranzi sac sag un  | 7060   | LDMFD  | (sp)!, {pc}  | 7920   | STMFD (sp)!, (link)  |
| 4900  | LDRB   | r5, [wp, #length]  | 5970   |  |  | 7070   |  | 1-27-7-12-7  | 7930   | BL write_line_star   |
| 4910  | LDRB   | r7, [wp, #columns]   | 5980   | .margin  |  | 7080 .init_  | com  |  | 7940   | ADD r4, wp, #headers   |
| 4920  | LDRB   | r9, [wp, #size]  | 5990   | STMFD  | (sp)!, (link)  | 7090   | LDR  | wp,[wp]  | 7950   | ADD r4,r4,r3,ASL #8  |
| 4930  | LDRB   | rØ, [wp, #balance]   | 6000   | .margin_loop   |  | 7100   | ADD  | r2, wp, #command   | 7960   | ADD r5,wp, #lengths  |
| 4940  | CMP  | rØ, #false   | 6010   | SUBS   | rø, rø, #1   | 7110 .copy_  |  |  | 7970   | LDRB r5, [r5, r3]  |
| 4950  | MOVEQ  | r8,r5  | 6020   |  | (sp)1, {pc}  | 7120   | LDRB   | r3,[r0],#1   |  | rite_hf_loop   |
| 4960  | BEQ  | show_pageloop  | 6030   | SWI  | "XOS_NewLine"  | 7130   | CMP  | r3,#32   | 7990   | SUBS r5, r5, #1  |
| 497Ø<br>498Ø  | MOV  | r8,#0<br>r0,#0   | 6040<br>6050   | В  | margin_loop  | 7140<br>7150   | MOVLT  | r3,#13   | 8000   | BMI written_hf   |
| 4990  |  | 10,#0  |  | .several   |  | 7160   | BGE  | r3,[r2],#1   | 8010<br>8020   | MOV r0,#32<br>SWI "XOS_BPut"   |
| 5000  | ADD  | r8,r8,#1   | 6070   | STMFD  | (sp)!, {link}  | 7170   | MOV  | copy_tail<br>pc,link   | 8030   | LDRB rØ,[r4],#1  |
| 5010  | ADD  | r0,r0,r7   | 6080   | .several loop  | (99)11(11111)  | 7180   | MOV  | pc,11mk  | 8040   | STMFD (sp)!, (r1)  |
| 5020  | CMP  | r0,r10   | 6090   | SUBS   | r0,r0,#1   | 7190 .Lists  | Set Helm   |  | 8050   | ADD r1,wp,#work  |
| 5030  | BLT  | calc_bal_size  | 6100   |  | (sp)!, {pc}^   | 7200   | EQUS   | "*ListSet sets one   | 8060   | MOV r2,#256  |
| 5040  | .show_pageloop   |  | 6110   | SWI  | &20100+ASC" "  |  |  | Aid parameters:"   | 8070   | SWI "XOS_ConvertCardin   |
| 5050  | LDRB   | rØ, [wp, #lmarg]   | 6120   | В  | several_loop   | 7210   | EQUS   | crlf\$+crlf\$  | al1"   |  |
| 5060  | BL   | several  | 6130   |  | The state of the s | 7220   | FNparhel   | ip("Balance <y n="">",</y>   | 8080   | LDMFD (sp)!, (r1)  |
| 5070  | MOV  | r6,#0 ;  |  | .no_such_file  |  | "Balance col   | lumns in pa  | art filled pages")   | 8090   | MOV r2, r0   |
|   | n count  |  | 6150   | EQUD   | 0  | 7230   |  | lp("Columns <n>","S</n>  | 8100   | BL write_line  |
| 5080  | .show_pageloop2  |  | 6160   | FNtext(  | "File not found")  | et number of   |  | columns")  |  |  |
|   |  |  |  |  |  |  |  |  | 8110   | B write_hf_loop  |
| 5090  | MLA  | r2,r6,r8,r4  | 6170   | 7.1 a.b.C.a.b.um   |  | 7240   | FNparhel   | lp("Eject <y n="">","F</y>   | 8120 .w  | ritten_hf  |
| 5090<br>5100  | CMP  | r2,r6,r8,r4<br>r2,r10  | 6180   | .ListSetup   | (an) ( (a) a) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  | 7240<br>ollow each p   | FNparhel   | lp("Eject <y n="">","F<br/>n page eject")</y>  | 8120 .w.<br>8130   | ritten_hf<br>MOV r0,#10  |
| 5090<br>5100<br>5110  | CMP<br>BGE   | r2,r6,r8,r4<br>r2,r10<br>blank   |  | .ListSetup<br>STMFD  | (sp)!,{r1-r11,link   | 7240<br>ollow each r<br>7250   | FNparhel<br>page with a<br>FNparhel  | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se</n></y></pre>   | 8120 .w<br>8130<br>8140  | ritten_hf MOV r0,#10 SWI "XOS_BPut"  |
| 5090<br>5100<br>5110<br>5120  | CMP<br>BGE<br>MLA  | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11 ;   | 618Ø<br>619Ø<br>}  | STMFD  |  | 7240<br>ollow each r<br>7250<br>t gap betwee   | FNparhel<br>page with a<br>FNparhel<br>en columns  | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se ')</n></y></pre>  | 8120 .w<br>8130<br>8140<br>8150  | ritten_hf<br>MOV r0,#10  |
| 5090<br>5100<br>5110<br>5120  | CMP<br>BGE   | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11 ;   | 6180   |  | r4,#0  | 7240<br>ollow each p<br>7250<br>t gap betwee<br>7260   | FNparhel<br>page with a<br>FNparhel<br>en columns*<br>FNparhel   | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se ') lp("Length <n>","Se</n></n></y></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)!, (pc)  |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130  | CMP<br>BGE<br>MLA<br>(column*length+1  | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11;<br>ine)*size<br>r3,r9  | 6180<br>6190<br>)<br>6200<br>6210  | STMFD  | r4,#Ø<br>set_string  | 7240<br>ollow each p<br>7250<br>t gap betwee<br>7260   | FNparhel<br>page with a<br>FNparhel<br>en columns'<br>FNparhel<br>printable  | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se ')</n></y></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)!,{pc}   |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150  | CMP<br>BGE<br>MLA<br>(column*length+1<br>MOV<br>.show_pageloop3  | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11 ;<br>ine)*size<br>r3,r9<br>r0,{r2],#1   | 6180<br>6190<br>)<br>6200<br>6210  | STMFD<br>MOV<br>B  | r4,#Ø<br>set_string  | 7240 ollow each p 7250 t gap betwee 7260 t number of 7270  | FNparhel<br>page with a<br>FNparhel<br>en columns'<br>FNparhel<br>printable  | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se ') lp("Length <n>","Se lines per page") lp("ColumnSize <n>"</n></n></n></y></pre>   | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.   | ritten_hf MOV r0,810 SWI "XOS_BPut" LDMFD (sp)!, (pc) a_commands FNCommand("Listing",1,1)  |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160  | CMP<br>BGE<br>MLA<br>(column*length+1<br>MOV<br>.show_pageloop3<br>LDRB<br>SWI   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ;ine)*size r3,r9 r0,[r2],#1 "XOS_WriteC"   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}   | STMFD  MOV B .ListHeader STMFD   | r4,#0<br>set_string<br>(sp)!,(r1-r11,link  | 7240 ollow each p 7250 t gap betwee 7260 t number of 7270 , "Set width 7280  | FNparhel page with a FNparhel en columns* FNparhel printable FNparhel of column* FNparhel  | <pre>lp("Eject <y n="">","F a page eject") lp("Gutter <n>","Se ') lp("Length <n>","Se lines per page") lp("ColumnSize <n>"</n></n></n></y></pre>   | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170  | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS   | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11 ;<br>ine)*size<br>r3,r9<br>r0,{r2],#1<br>"XOS_WriteC"<br>r3,r3,#1   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}   | STMFD  MOV B .ListHeader STMFD  MOV  | r4,#0<br>set_string<br>(sp)!,{r1-r11,link<br>r4,#1   | 7240 ollow each p 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width  | FNparhel page with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel  | <pre>Lp("Eject <y n="">","F a page eject") pp("Gutter <n>","Se ') lp("Length <n>","Se lines per page") pp("ColumnSize <n>" ') lp("Width <n>","Set</n></n></n></n></y></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) DM1 FNcommand("ListSetup",0,25   |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180  | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS BNE   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ;ine)*size r3,r9 r0,[r2],#1 "XOS_WriteC"   | 6180<br>6190<br>)<br>6200<br>6210<br>6220<br>6230<br>)<br>6240<br>6250   | STMFD  MOV B .ListHeader STMFD  MOV B  | r4,#0<br>set_string<br>(sp)!,(r1-r11,link  | 7240 ollow each p 7250 t gap betwee 7260 t number of 7270 , "Set width 7280 page width 7290  | FNparhel page with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel ') FNparhel  | <pre>up("Eject <y n="">","F i page eject") ip("Gutter <n>", "Se ') up("Length <n>", "Se lines per page") ip("ColumnSize <n>" ') ip("Width <n>","Set ip("Width <n>","Set</n></n></n></n></n></y></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.<br>5)   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) DM1 FNcommand("ListSetup",0,25   |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180<br>5190  | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS BNE .blank  | r2,r6,r8,r4<br>r2,r10<br>blank<br>r2,r9,r2,r11 ;<br>ine)*size<br>r3,r9<br>r0,[r2],#1<br>"XOS_WriteC"<br>r3,r3,#1<br>show_pageloop3   | 6180<br>6190<br>}<br>6200<br>6210<br>6230<br>}<br>6240<br>6250<br>6260   | STMFD  MOV B ListHeader STMFD  MOV B ListFooter  | r4,#0<br>set_string<br>(sp)!,{r1-r11,link<br>r4,#1<br>set_string   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin   | FNparhel page with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel ") FNparhel above head   | <pre>lp("Eject <!--/N-->","Fi a page eject") lp("Gutter <m>","Se ') lp("Gutter <m>","Se lines per page") lp("ColumnSize <m>" ') lp("Width <m>","Set lines on ","Set let")</m></m></m></m></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.<br>5)<br>8210 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)!,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) SW1 FNcommand("ListSetup",0,25 SW2 FNcommand("ListHeader",0,2  |
| 5090<br>5100<br>51100<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180<br>5190<br>5200   | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWII SUBS ENE .blank ADD   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1  | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270   | STMFD  MOV B .ListHeader STMFD  MOV B  | r4,#0<br>set_string<br>(sp)!,{r1-r11,link<br>r4,#1   | 7240 cllow each p 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300  | FNparhel<br>page with a<br>FNparhel<br>en columns'<br>FNparhel<br>printable<br>FNparhel<br>of column'<br>FNparhel<br>')<br>FNparhel<br>above head<br>FNparhel  | <pre>lp("Eject <y n="">","Fi page eject") lp("Gutter <n>","Se ) lp("Length <n>","Se lines per page") lp("ColumnSize <n>") lp("Width <n>","Set lp("Width <n>","Set lp("TopMargin <n>", ler")</n></n></n></n></n></n></y></pre>  | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8200 .c.<br>5)<br>8210 .c.<br>55)  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)!,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) FNcommand("ListSetup",0,25 cm2 FNcommand("ListBeader",0,2  |
| 5090<br>5100<br>51100<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180<br>5190<br>5200<br>5210   | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS ENE .blank ADD CMP  | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9 r0,{r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}  | STMFD  MOV B .ListHeader STMFD  MOV B .ListFooter STMFD  | r4,#0<br>set_string<br>(sp)!,(r1-r11,link<br>r4,#1<br>set_string<br>(sp)!,(r1-r11,link   | 7240 ollow each p 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set margy  | FNparhel page with a FNparhel printable FNparhel of columns FNparhel of printable FNparhel TNParhel   | <pre>up("Eject <y n="">","F i page eject") up("Gutter <n>","Se t) up("Length <n>","Se lines per page") up("ColumnSize <n>" up("Width <n>","Set ip("TopMargin <n>", ip("HeaderMargin <n ",="" <n="" and="" header="" in="" ip("headermargin="" pre="" text")<=""></n></n></n></n></n></n></y></pre>   | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.<br>55)<br>8210 .c.<br>55)<br>8220 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,{pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSett",0,255) DM1 FNcommand("ListSettp",0,25 DM2 FNcommand("ListHeader",0,2 DM3 FNcommand("ListFooter",0,2   |
| 5090<br>5100<br>51100<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180<br>5190<br>5200   | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS ENE .blank ADD CMP LDRNEB   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1  | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}  | STMFD  MOV B ListHeader STMFD  MOV B ListFooter STMFD  MOV   | r4,#0<br>set_string<br>(sp)!,{r1-r11,link<br>r4,#1<br>set_string   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg  | FNparhel page with a FNparhel en columns' FNparhel of column' FNparhel of FNparhel of FNparhel in FNparhel bloom FNparhel in FNparhel bloom FNparhel fnparhel fnparhel fnparhel fnparhel fnparhel fnparhel fnparhel fnparhel   | <pre>tp("Eject <y n="">","Fi     page eject") .p("Gutter <n>", "Se     ) .p("Gutter <n>", "Se     ) .p("Length <n>", "Se     lines per page") .p("ColumnSize <n>" .) .p("Width <n>", "Set .p("TopMargin <n>", .p("HeaderMargin <n .<="" .p("footermargin="" .p("header="" .p("headermargin="" <n="" and="" td="" text")=""><td>8120 .w.<br/>8130<br/>8140<br/>8150<br/>8160<br/>8170 .l.<br/>8180<br/>8200 .c.<br/>5)<br/>8210 .c.<br/>55)<br/>8220 .c.</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListHeader",0,2 om3 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,2</td></n></n></n></n></n></n></n></y></pre>   | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8200 .c.<br>5)<br>8210 .c.<br>55)<br>8220 .c.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListHeader",0,2 om3 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,2  |
| 5090<br>5100<br>5110<br>5120<br>base+<br>5130<br>5150<br>5150<br>5170<br>5180<br>5200<br>5210<br>5220<br>5230<br>5240   | CMP BGE MIA (column*length+l Mov .show_pageloop3 LDRB SWI SUBS BNE .blank ADD CMP LDRNEB BLME BNE  | r2.r6,r8,r4 r2.r10 blank r2.r9,r2.r11 ;ine)*size r3.r9 r0.[r2],#1 "XOS WriteC" r3.r3,#1 show.pageloop3 r6.r6,#1 r6.r7 r0.[wp,#gutter] several show.pageloop2   | 6180<br>6190<br>8200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}<br>6280<br>6290<br>6300   | STMFD  MOV B .ListHeader STMFD  MOV B .ListFooter STMFD  | r4,#0<br>set_string<br>(sp)!,(r1-r11,link<br>r4,#1<br>set_string<br>(sp)!,(r1-r11,link   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg   | FNparhel page with a FNparhel en columns FNparhel printable printable fNparhel of column FNparhel bove head FNparhel printed the service fNparhel  | <pre>tp("Eject <!--/N-->","Fi 1 page eject") tp("Gutter <n>","Se t) tp("Gutter <n>","Se times per page") tp("ColumnSize <n>" ') tp("Width <n>","Set times times</n></n></n></n></pre>      | 8120 .w.<br>8130<br>8140<br>8150<br>8160<br>8170 .l.<br>8180<br>8190<br>8200 .c.<br>55)<br>8210 .c.<br>55)<br>8220 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,{pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSett",0,255) DM1 FNcommand("ListSettp",0,25 DM2 FNcommand("ListHeader",0,2 DM3 FNcommand("ListFooter",0,2   |
| 5090<br>5100<br>5110<br>5120<br>base+<br>5130<br>5140<br>5150<br>5160<br>5170<br>5200<br>5210<br>5220<br>5230<br>5240<br>5250   | CMP BGE MLA MOV .show_pageloop3 LDRB LDRB ENE .blank ADD CMP LDRNBB BLKE ENE SWI   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine"   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}<br>6280<br>6290<br>6300<br>6310  | MOV B ListHeader STMFD MOV B ListFooter STMFD MOV B ListFooter STMFD MOV .set_string BL ADD  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set marg  | FNparhel age with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel if FNparhel if FNparhel if in betweer FNparhel in betweer FNparhel in between FNparhel in between FNparhel in between FNparhel in between   | <pre>up("Eject <y n="">","Fi     page eject") .p("Gutter <n>","Se     ) .p("Gutter <n>","Se     ) .p("ColumnSize <n>" .p("ColumnSize <n>" .p("Width <n>","Set .p("TopMargin <n>","Set .p(""TopMargin <n )="" .header="" .p("footermargin="" .p("headermargin="" .p("sottommargin="" .text="" <n="" and="" footer")="" footer")<="" pre="" text")=""></n></n></n></n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8250 8240 8250  | ritten_hf MOV r0,#10 SWI "XOS_BPUt" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) om1 FNcommand("ListSetup",0,25 om2 FNcommand("ListSetup",0,25 om3 FNcommand("ListPare",0,2 FNcommand("ListPare",0,0) FNcommand("ListPare",0,0) FNcommand("ListSave",1,1) EQUD 0  |
| 5090<br>5100<br>5110<br>5120<br>base+<br>5130<br>5140<br>5150<br>5160<br>5170<br>5200<br>5210<br>5220<br>5220<br>5230<br>5240<br>5250<br>5260   | CMP BGE MIAA (column*length+l Mov .show_pageloop3 LDRB SWI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD ADD   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9 r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}<br>6280<br>6300<br>6310  | MOV B ListHeader STMFD MOV B STMFD MOV B STMFD MOV B STMFD MOV STMFD MOV Set_string BL ADD ADD   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,wp,#headers r8,r8,r4,ASL #8   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330  | FNparhel<br>page with a<br>FNparhel<br>en columns'<br>FNparhel<br>printable<br>of column'<br>FNparhel<br>above head<br>FNparhel<br>jin betweer<br>FNparhel<br>jin betweer<br>FNparhel<br>jin betweer<br>FNparhel<br>jin betweer  | <pre>tp("Eject <!--/N-->","Fi 1 page eject") tp("Gutter <n>","Se t) tp("Gutter <n>","Se times per page") tp("ColumnSize <n>" ') tp("Width <n>","Set times times</n></n></n></n></pre>      | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8220 .c. 55) 8220 .c. 600 8250 8260 ]  | ritten_hf MOV r0,#10 SWI "XOS_BPUT" LDMFD (sp)!,{pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) om1 FNcommand("ListSetup",0,25 om2 FNcommand("ListHeader",0,2 om3 FNcommand("ListPooter",0,2 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0   |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5180<br>5200<br>5210<br>5220<br>5230<br>5240<br>5250<br>5250<br>5270  | CMP BGE MLA (column*length+1 MOV .show_pageloop3 LDRB SWI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP CMP CMP CMP CMP CMP  | r2.r6,r8,r4 r2.r10 blank r2.r9,r2.r11 ; ine)*size r3.r9  r0,[r2],#1 "XOS_WriteC" r3.r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8  | 6180<br>6190<br>6200<br>6210<br>6220<br>6230<br>)<br>6240<br>6250<br>6270<br>)<br>6280<br>6290<br>6300<br>6310<br>6320<br>6330   | MOV B ListHeader STMFD MOV B ListFooter STMFD MOV Set_string ADD ADD ADD   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,NSL #8 r9,wp,#lengths   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 7270 "Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 ,","Set marg 7330 ,","Set marg 7330 ,","Set left marg   | FNparhel age with a FNparhel or Columns' FNparhel of column' FNparhel of column' FNparhel above head FNparhel jin betweer FNparhel jin betweer FNparhel jin betweer FNparhel jin betweer FNparhel jin between FNparhel jin below f FNparhel jin below f FNparhel argin")   | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     p("Gutter <n>","Se     lines per page") tp("ColumnSize <n>") tp("Width <n>","Set     ine (n)","Set     ine</n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8150 8170 .l. 8160 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 620 8240 8250 8240 8250 8260 JR   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) om1 FRCommand("ListSetup",0,25 om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,2 FRCommand("ListFars",0,0) FRCommand("ListSave",1,1) EQUD 0  KT LISTAID assembled in ";0%-co  |
| 5090<br>5100<br>5110<br>5120<br>base+(<br>5130<br>5140<br>5150<br>5160<br>5170<br>5200<br>5200<br>5200<br>5200<br>5200<br>5200<br>5200<br>52  | CMP BGE MLA MLA MOV .show_pageloop3 LDRB SWIS SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BLNE BNE SWI ADD CMP BLNE BNE BNE SWI ADD CMP BLNE BNE BNE BNE BNE BNE BNE BNE BNE BNE B   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS WriteC" r3,r3,#1 show_pageloop3  r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop   | 6180<br>6190<br>}<br>6200<br>6210<br>6220<br>6230<br>}<br>6240<br>6250<br>6260<br>6270<br>}<br>6280<br>6310<br>6310<br>6320<br>6330  | MOV B ListHeader STMFD  MOV B ListFooter STMFD  MOV .ListFooter STMFD  ADD ADD ADD ADD ADD   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,wp,#headers r8,r8,r4,ASL #8   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 ,"Get left m 7340  | FNparhel age with a FNparhel or columns' FNparhel printable FNparhel of column' FNparhel ') FNparhel above head FNparhel fin betweer FNparhel jin betweer FNparhel jin betweer FNparhel jin betweer FNparhel gin below if FNparhel argin') EQUS  | <pre>up("Eject <y n="">","Fi     page eject") .p("Gutter <n>","Se     ) .p("Gutter <n>","Se     ) .p("ColumnSize <n>" .p("ColumnSize <n>" .p("Width <n>","Set .p("TopMargin <n>","Set .p(""TopMargin <n )="" .header="" .p("footermargin="" .p("headermargin="" .p("sottommargin="" .text="" <n="" and="" footer")="" footer")<="" pre="" text")=""></n></n></n></n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8230 .c. 620 .c.   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) om1 FNcommand("ListSetup",0,25 om2 FNcommand("ListFooter",0,2 om3 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0 FNcommand("ListFars",0,0) FNcommand("ListPars",0,0) FNcommand("ListP |
| 5090 5100 5110 5120 base++ 5130 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5250 5260 5270 5280   | CMP BGE MIA MIA MOV .show_pagelcop3 LDRB SWI SUBS ENE .blank ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE LORNEB BLNE LORNEB BLNE LORNEB BLNE LORNEB LORN | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ;ine)*size r3,r9 r0,[r2],#1 "XOS WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop  | 6180 6190 } 6200 6210 6210 6230 } 6240 6250 6260 6270 } 6280 6310 6320 6330 6340 6350  | MOV B NOV B  | r4,#0 set_string (sp)!, {r1-r11,link r4,#1 set_string (sp)!, {r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .ListS   | FNparhel bear with a FNparhel or Columns' FNparhel printable FNparhel of column' FNparhel ') FNparhel above hear FNparhel yin betweer FNparhel yin betweer FNparhel yin between FNparhel yin below f ENparhel ENDENDE EDUSS  | <pre>tp("Eject <!--/N-->","Fi</pre>  | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 ] 8270 NE: 8280 PR de; byt:  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands =_command(sp)1,(pc) fNcommand("Listing",1,1) FNcommand("ListSet",0,255) fNcommand("ListSetup",0,25 com2 FNcommand("ListHeader",0,2 com3 FNcommand("ListPars",0,2 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT*ListAid assembled in ";0%-co Bs" S"OS_File",10,"%.ListAid",FFA,  |
| 5090 5100 5110 5120 base+1 5130 5140 5150 5160 5170 5180 5210 5210 5210 5210 5210 5220 5230 5240 5250 5260 5270 5280 5290 5300  | CMP BGE MLA MOV .show_pageloop3 LDRB ENE .blank ADD CMP LDRNB BLNE BLNE BNE SWI ADD CMP LDRNB BLNE BNE SWI ADD CMP LORNBB BLNE BNE SWI ADD CMP   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop mr4,r5   | 6180<br>6190<br>)<br>6200<br>6210<br>6220<br>6230<br>)<br>640<br>6250<br>6260<br>6270<br>6300<br>6310<br>6310<br>6320<br>6330<br>6340<br>6350<br>6350  | MOV B ListHeader STMFD MOV B ListFooter STMFD MOV Set_string BL ADD ADD ADD ADD LDRB   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 Lists 7350   | FNparhel oage with a FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparhel of print of FNparhel of column's FNparhel of column's FNparhel of FNparhel oargin') EQUS Set_Syntax FNtext (\$\frac{1}{2}\)   | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     p("Gutter <n>","Se     lines per page") tp("ColumnSize <n>") tp("Width <n>","Set     ine (n)","Set     ine</n></n></n></n></y></pre>   | 8120 .w. 8130 8146 8150 8160 8170 .l. 8180 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 60 8250 8260 ] 8270 NE: 8280 PR de; " byt. 8290 SY, code, 0%   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 om2 FNcommand("ListHeader",0,2 om3 FNcommand("ListFooter",0,2 FNcommand("ListPare",0,0) FNcommand("ListPare",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co as" S "OS_File",10,"%.ListAid",&FFA,  |
| 5090 5100 5110 5120 base++ 5130 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5250 5260 5270 5280   | CMP BGE MIA MIA MOV .show_pagelcop3 LDRB SWI SUBS ENE .blank ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE ENE SWI ADD CMP LDRNEB BLNE LORNEB BLNE LORNEB BLNE LORNEB BLNE LORNEB LORN | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ;ine)*size r3,r9 r0,[r2],#1 "XOS WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop  | 6180 6190 } 6200 6210 6210 6230 } 6240 6250 6260 6270 } 6280 6310 6320 6330 6340 6350  | MOV B CARE COMP COMP COMP COMP COMP COMP COMP COMP   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 "Set left m 7340 7350 .Lists 7360 <setting>]"</setting>  | FNparhel oage with a FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparhel of print of FNparhel of column's FNparhel of column's FNparhel of FNparhel oargin') EQUS Set_Syntax FNtext (\$\frac{1}{2}\)   | <pre>tp("Eject <!--/N-->","Fi</pre>  | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8190 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 6270 NE. 8280 PR. de; byth 8290 SY, code, OM.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 om2 FNcommand("ListHeader",0,2 om3 FNcommand("ListFooter",0,2 FNcommand("ListPare",0,0) FNcommand("ListPare",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co as" S "OS_File",10,"%.ListAid",&FFA,  |
| 5090 5100 51100 5120 base+ 5130 5140 5150 5160 5170 5170 5180 5200 5210 5220 5240 5250 5260 5270 5280 5280 5290 5300 5310 5320 5320   | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE .SWI ADD CMP CMP CMP BLT .blank_to_botto CMP   | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2].#1 "XOS WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7.r0.[wp.#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop  | 6180<br>6190<br>6200<br>6210<br>6220<br>6230<br>)<br>6240<br>6250<br>6260<br>6270<br>)<br>6300<br>6310<br>6320<br>6330<br>6350<br>6350<br>6350   | MOV B ListHeader STMFD MOV B ListFooter STMFD MOV Set_string BL ADD ADD ADD ADD LDRB   | r4,#0 set_string (sp)!, {r1-r11,link r4,#1 set_string (sp)!, {r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 Lists 7350   | FNparhel page with a FNparhel printable FNparhel printable FNparhel of column' FNparhel above head FNparhel pin betweer FNparhel pin betweer FNparhel pin betweer FNparhel pin betweer FNparhel argin' EQUS Set_Syntax FNtext(s')  | <pre>tp("Eject <!--/N-->","Fi</pre>  | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8210 .c. 8200 .c. 8300 .c. 8300 .c.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) m1 FNcommand("ListSetup",0,25  m2 FNcommand("ListHeader",0,2  FNcommand("ListFooter",0,2  FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  XT LNT"ListAid assembled in ";0%-co 8s" S "OS_File",10,"%,ListAid",&FFA,D  |
| 5090 5100 5100 5120 base+(  | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS ENE .blank ADD CMP LDRNEB BLNE ENE SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD B B B B B B B B B B B B B B B B B B  | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_Write0" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop mr4,r5 do_footer "XOS_NewLine"   | 6180 6190 } 6200 6210 6210 6220 6230 } 6260 6270 } 6280 6370 6310 6320 6350 6360 63770 6380 6390 6400  | MOV B HISTORY MOV B STMFD MOV B STMFD MOV B STMFD MOV B STMFD MOV Set_string BL ADD ADD ADD ADD ADD ADD ADD ADD BED CMP BLT BEQ CMP BLT BEQ CMP  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,NSL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup red_setup ro,#862"""   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7330 ,","Set marg 7330 ,"Set left r 7340 7350 .Lists 7360 <setting)] 7370<="" td=""><td>FNparhel of the second second</td><td><pre>tp("Eject <!--/N-->","Fi</pre></td><td>8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8210 .c. 8200 .c. 8300 .c. 8300 .c.</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 om3 FNcommand("ListFooter",0,2 om3 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListFars",0,0) FNcommand("List</td></setting)]>  | FNparhel of the second  | <pre>tp("Eject <!--/N-->","Fi</pre>  | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8210 .c. 8200 .c. 8300 .c. 8300 .c.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 om3 FNcommand("ListFooter",0,2 om3 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListFars",0,0) FNcommand("List |
| 5090 5100 5110 5120 base+-( 5130 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5255 5260 5270 5280 5290 5300 5310 5320 5330 5340 5355   | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWIS BNE .blank ADD CMP LDRNBB BLNE BNE SWI ADD CMP LORNBB BLNE BNE SWI ADD CMP LORNBB BLNE BNE SWI ADD CMP BEQ SWI ADD BEQ SWI ADD BEQ SWI ADD BEQ SWI ADD B .do_footer  | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ; ine)*size r3,r9  r0,[r2],#1 "XOS_Write(" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop m r4,r5,defooter "XOS_NewLine" r4,r4,#1 blank_to_bottom  | 6180<br>6190<br>6200<br>6210<br>6220<br>6230<br>7<br>6250<br>6260<br>6270<br>7<br>6300<br>6310<br>6320<br>6330<br>6340<br>6350<br>6360<br>6370<br>6380<br>6390<br>6390<br>6390<br>6390<br>6390<br>6390<br>6390<br>639          | MOV B ListHeader STMFD  MOV B ListFooter STMFD  MOV .set_string BL ADD ADD ADD ADD LORB CMP BLT BEQ CMP BEC CMP BEC  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup red_setup red_seturing get_string   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width" 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting>]" 7370 7380 .Lists 7390 a multi-col</setting>  | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of column' FNparhel of rolumn' FNparhel argin' EQUS Set_Syntax FNtext(s') ing_Help EQUS   | <pre>up("Eject <y n="">","Fa a page eject") up("Gutter <n>","Se t) up("Gutter <n>","Se t) up("ColumnSize <n>" t) up("ColumnSize <n>" t) up("Width <n>","Set up("TopMargin <n>", up("TopMargin <n>", up("HeaderMargin <n <n="" and="" footer")="" header="" text="" text")="" the="" up("eottommargin="" up("footermargin="" up("leftmargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces up of a file."</n></n></n></n></n></n></n></n></y></pre>   | 8120 .w. 8130 8146 8150 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 600 8250 8260 l. 8270 NE 8280 PR de; byt. 8290 SY, code, 0% 8300 EN, 8310 E. 8320 DE 8330 [0]  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, (pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 oma FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co as" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$, help\$) PT pass EQUS "-"+com\$   |
| 5090 5100 5120 5120 5120 5120 5140 5150 5140 5150 5170 5180 5190 5200 5210 5220 5230 5240 5250 5260 5260 5260 5260 5260 5260 526  | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS SUBS LDRNE BNE .blank ADD CMP LDRNEB BLNE BNE ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD B .do_footer LDRB B .do_footer  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2],#1 **XOS_WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show_pageloop2 **XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop  mr4.r5 do_footer **XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop  | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6260 6270 } 6280 6390 6310 6320 6330 6340 6350 6370 6380 6390 6400 6410  | MOV B NOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,Wp,#headers r8,r8,r4,XSL #8 r9,Wp,#lengths r6,Wp,#command r0,[r6],#1 r0,#32 got_setup read_setup r0,#ASC**" get_string r0,#ASC**"  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting) .list="" 7370="" 7380="" 7390="" 7400<="" a="" multi-col="" td=""><td>FNparhel oage with a Fnparhel of columns' FNparhel of column' FNparhel of FNparhel of FNparhel of FNparhel of FNparhel of FNparhel of FNparhel oargin') EOUS Set_Syntax FNtext(s') ing_Help EOUS summ listing EOUS</td><td><pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pi("Gutter <n>","Se     ines per page") tp("ColumnSize <n>") tp("Width <n>","Set     ines per page") tp("Width <n>","Set     ines     ines</n></n></n></n></n></y></pre></td><td>8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 6270 NE: 8280 PR de; byt, code, 0% 8300 ER 8310 : 8320 DE: 8310 :</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListHeader",0,2 om3 FRCommand("ListPare",0,0) FRCOMMAND("ListAid",0,0) FRCOMMAND("M.ListAid",0,0) FRCOMMAND("M.Li</td></setting)>  | FNparhel oage with a Fnparhel of columns' FNparhel of column' FNparhel of FNparhel of FNparhel of FNparhel of FNparhel of FNparhel of FNparhel oargin') EOUS Set_Syntax FNtext(s') ing_Help EOUS summ listing EOUS   | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pi("Gutter <n>","Se     ines per page") tp("ColumnSize <n>") tp("Width <n>","Set     ines per page") tp("Width <n>","Set     ines     ines</n></n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 6270 NE: 8280 PR de; byt, code, 0% 8300 ER 8310 : 8320 DE: 8310 :  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListHeader",0,2 om3 FRCommand("ListPare",0,0) FRCOMMAND("ListAid",0,0) FRCOMMAND("M.ListAid",0,0) FRCOMMAND("M.Li |
| 5090 5100 5100 5120 base+(  | CMP BGE MLA MOV .show_pageloop3 LDRB ENE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD B .do_footer LDRB BL   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp.#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop  mr4,r5 do_footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r4,r4,#1 blank_to_bottom r4,r4,#1 plank_to_bottom r4,r4,#1 blank_to_bottom r0,[wp.#fmarg] margin   | 6180<br>6190<br>)<br>6200<br>6210<br>6220<br>6230<br>)<br>6260<br>6270<br>6270<br>6300<br>6310<br>6320<br>6310<br>6320<br>6350<br>6360<br>6370<br>6360<br>6370<br>6360<br>6370<br>6360<br>6370<br>6360<br>6410<br>6420<br>6420 | MOV B HALL STMFD MOV B HALL STMFD MOV B HALL STMFD MOV Set_String MOV Set_String ADD ADD ADD ADD LDRB CMF BEQ CMF BEQ CMF BEQ CMF BEQ CMF BEQ CMF BEQ  | r4,#0 set_string (sp)!, (r1-r11, link r4,#1 set_string (sp)!, (r1-r11, link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup red_setup ro,#ASC"e" get_string r0,#ASC"e" is_anum  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 ,"Set left m 7340 7350 .Lists 7360 .Lists 7390 a multi-col 7400 7410 .Listsi  | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of column' FNparhel of FNparhel | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>" t) tp("Width <n>","Set     ine yer page") tp("Width <n>","Set     ine yer page") tp("TopMargin <n>", tp("HeaderMargin <n <n="" and="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces     ing of a file." crlf\$</n></n></n></n></n></n></n></y></pre>  | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 620 8250 8240 8250 8260 PR 6e; byt. 8260 PR 6e; byt. 8310 El 8320 DE 8330 El 830 E | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 omg FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co 85" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$,help\$) PT pass EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH  |
| 5090 5100 5100 5120 base+1 5130 5140 5150 5160 5170 5180 5190 5200 5210 5210 5210 5210 5220 5230 5240 5250 5260 5270 5280 5280 5280 5280 5280 5280 5280 528   | CMP BGE MLA MOV .show_pageloop3 LDRB SNI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP EDRE BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE ADD CMP LDRNEB BLT .blank_to_botto CMP EEQ SWI ADD B .do_footer LDRB BLL MOV  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2],#1 "XOS WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r6.#1 r6.r7 r0.[wp.#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop mr4.r5 dofooter "XOS_NewLine" r4.r4.#1 blank_to_bottom r0.[wp.#fmarg] margin r0.#2  | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6260 6270 } 6380 6310 6340 6350 6360 6370 6380 6390 6400 6410 6420 6430  | MOV B HISTORY MOV B STMFD MOV  | r4,#0 set_string (sp)!, {r1-r11,link r4,#1 set_string (sp)!, {r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup r0,#ASC**** get_string r0,#ASC**** is_a_num r0,#ASC**** is_a_num r0,#ASC****  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 (Set each 7340 7350 .Lists 7360 (Setting) 7370 7380 .Lists 7390 a multi-col 7400 7410 .Lists 7420  | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of column' FNparhel of FNparhel | <pre>up("Eject <y n="">","Fa a page eject") up("Gutter <n>","Se t) up("Gutter <n>","Se t) up("ColumnSize <n>" t) up("ColumnSize <n>" t) up("Width <n>","Set up("TopMargin <n>", up("TopMargin <n>", up("HeaderMargin <n <n="" and="" footer")="" header="" text="" text")="" the="" up("eottommargin="" up("footermargin="" up("leftmargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces up of a file."</n></n></n></n></n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 600 8250 8260 le 8260 le 8260 le 8260 PR de; between le 8290 SY, code, O% 8300 ER 8310 [0] 8320 DE 8330 [0] 8340 8350 R\$31) 8360   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, (pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) DM1 FNcommand("ListSetup",0,25 DM2 FNcommand("ListFooter",0,2 DM3 FNcommand("ListFooter",0,2 DM3 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0 FNcommand("ListFooter", |
| 5090 5100 5100 5120 base+(  | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SUBS ENE .blank ADD CMP LDRNEB BLNE ENE SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD CMP BEQ SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD BUT .blank_to_botto CMP BEQ SWI ADD BE BEQ SWI ADD BE BEQ SWI ADD BE BEQ SWI ADD BE BEA BE  | r2.r6,r8,r4 r2.r10 blank r2.r9,r2.r11 ;ine)*size r3.r9  r0,[r2],#1 "XOS WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop mr4,r5 do_footer "XOS_NewLine" r4,r4,#1 r4,r4,#1 r4,r4,#1 r4,r4,#1 r4,r5 do_footer "XOS_NewLine" r4,r4,#1 blank r4,r8 r4,r8 do_footer "XOS_NewLine" r4,r4,#1 blank r4,r4,#1 blank r4,r4,#1 blank r4,r4,#1 blank r6,r9,#fmarg] margin r0,#2 head_foot  | 6180<br>6190<br>7<br>6200<br>6210<br>6220<br>6230<br>6250<br>6260<br>6270<br>6300<br>6310<br>6310<br>6320<br>6330<br>6340<br>6350<br>6360<br>6370<br>6380<br>6390<br>6400<br>6410<br>6420<br>6430                              | MOV B HALL STMFD MOV B HALL STMFD MOV B HALL STMFD MOV B HALL STMFD MOV SET_STMFD MOV SET_STMFD MOV ADD ADD ADD ADD ADD ADD ADD ADD BECKER SECOND SECOND MOVE SECO | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup ro,#ASC""" get_string r0,#ASC""" jet_anum r0,#ASC""" jet_anum   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 7270 7270 7280 set width 7280 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting); ")<="" .listi="" .lists="" 7370="" 7380="" 7390="" 7400="" 7410="" 7420="" a="" multi-col="" td=""><td>FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of column' FNparhel of FNparhel</td><td><pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>" t) tp("Width <n>","Set     ine yer page") tp("Width <n>","Set     ine yer page") tp("TopMargin <n>", tp("HeaderMargin <n <n="" and="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces     ing of a file." crlf\$</n></n></n></n></n></n></n></y></pre></td><td>8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8260 ] 8270 NE 8286 PR de; " byt. 8290 SY, code, 0% 8300 ENI 8310 .e. 8320 DE: 8330 DE:</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 omg FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co 85" S "OS_File",10,"%.ListAid",&amp;FFA, D F FNparhelp(com\$,help\$) PT pass EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH</td></setting);>   | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of column' FNparhel of FNparhel | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>" t) tp("Width <n>","Set     ine yer page") tp("Width <n>","Set     ine yer page") tp("TopMargin <n>", tp("HeaderMargin <n <n="" and="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces     ing of a file." crlf\$</n></n></n></n></n></n></n></y></pre>  | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8260 ] 8270 NE 8286 PR de; " byt. 8290 SY, code, 0% 8300 ENI 8310 .e. 8320 DE: 8330 DE:   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 omg FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,2 FNcommand("ListFooter",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  XT INT"ListAid assembled in ";0%-co 85" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$,help\$) PT pass EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH  |
| 5090 5100 5110 5120 base+-( 5130 5140 5150 5160 5170 5180 5200 5210 5220 5220 5220 5220 5220 522  | CMP BGE MLA MOV .show_pageloop3 LDRB SNIS SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP LORNEB BLNE BLNE BNE SWI ADD CMP BLOTTO CMP BEQ SWI ADD B .do_footer LDRB BL MOV BL LDRB   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9  r0,[r2],#1 "XOS_Write(" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop m r4,r5,wine r5,r4,r8 do_footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#eject]   | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6270 } 6280 6370 6310 6310 6310 6310 6310 6340 6410 6420 6430 6440 6430  | MOV B MOV B STMFD  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,(r6],#1 r0,#32 got_setup read_setup read_setup red_setup r0,#ASC"" get_string r0,#ASC" is_a_num r0,#ASC" not_a_num r0,#ASC" not_a_num r0,#ASC"  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7310 >","Set marg 7310 >","Set marg 7310 >","Set left m 7340 7350 .Lists 7360 <setting)! ")="" .listi="" 380="" 7370="" 7390="" 7400="" 7410="" 7420="" 7430<="" a="" multi-col="" td=""><td>FNparhel age with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel of FNparhel en column' FNparhel en column' FNparhel en column' FNparhel en column' FNparhel prin betweer FNparhel prin betweer FNparhel prin betweer FNparhel argin') EQUS Set_Syntax FNtext(s') ing_Help EQUS ing_Syntax FNtext(s') FNparhel en column listin EQUS ing_Syntax FNtext(s')</td><td><pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>") tp("Width <n>","Set     lines per page") tp("Width <n>","Set     in ("TopMargin <n>",     in ("HeaderMargin <n <n="" and="" colter")="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("eoftmargin="" tp("eoftommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces</n></n></n></n></n></n></n></y></pre></td><td>8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 60 8240 8250   8240 8250   8260   8270 NE: 8280 PR de; byt. 8290 SY, code, OW. 8310   8320 DE: 8330 [0: 8340 8350   8350 R\$311) 8360 8370</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, {pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  oml FNcommand("ListSetup",0,25  oma FNcommand("ListPare",0,2  oma FNcommand("ListPooter",0,2  FNcommand("ListPare",0,0) FNcommand("ListBeater",0,0) FNcommand("ListPare",0,0) FNcommand("</td></setting)!>  | FNparhel age with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel of FNparhel en column' FNparhel en column' FNparhel en column' FNparhel en column' FNparhel prin betweer FNparhel prin betweer FNparhel prin betweer FNparhel argin') EQUS Set_Syntax FNtext(s') ing_Help EQUS ing_Syntax FNtext(s') FNparhel en column listin EQUS ing_Syntax FNtext(s')   | <pre>tp("Eject <y n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>") tp("Width <n>","Set     lines per page") tp("Width <n>","Set     in ("TopMargin <n>",     in ("HeaderMargin <n <n="" and="" colter")="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("eoftmargin="" tp("eoftommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces</n></n></n></n></n></n></n></y></pre>  | 8120 .w. 8130 8140 8150 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 60 8240 8250   8240 8250   8260   8270 NE: 8280 PR de; byt. 8290 SY, code, OW. 8310   8320 DE: 8330 [0: 8340 8350   8350 R\$311) 8360 8370  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, {pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  oml FNcommand("ListSetup",0,25  oma FNcommand("ListPare",0,2  oma FNcommand("ListPooter",0,2  FNcommand("ListPare",0,0) FNcommand("ListBeater",0,0) FNcommand("ListPare",0,0) FNcommand(" |
| 5090 5100 5100 5120 base+(  | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS SWI SUBS CMP LDRNEB BLNE BNE .blank ADD CMP LDRNEB BLNE BNE .ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD B .do_footer LDRB BL LDRB BL LDRB BL LDRB BL CMP CMP CMP BEQ CMP SWI ADD CMP BEQ CMP BEQ CMP BEQ CMP CMP BEQ CMP CMP BEQ CMP CMP CMP CMP BEQ CMP   | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2],#1 "XOS_WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop "AUSO_NewLine" r4.r4.#1 r4.r8 show_pageloop "AUSO_NewLine" r4.r4.#1 r4.r8 show_pageloop "AUSO_NewLine" r4.r4.#1 blank_to_bottom r0.[wp,#fmarg] margin r0.#2 head_foot r0.[wp,#eject] r0.#Tune  | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6260 6270 } 6300 6310 6320 6330 6340 6400 6410 6420 6430 6440 6450 6460  | MOV B HALL STMFD MOV B HALL STMFD MOV B HALL STMFD MOV B HALL STMFD MOV SET_STMFD MOV SET_STMFD MOV ADD ADD ADD ADD ADD ADD ADD ADD BECKER SECOND SECOND MOVE SECO | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup ro,#ASC""" get_string r0,#ASC""" jet_anum r0,#ASC""" jet_anum   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 7270 7270 7280 set width 7280 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting); ")<="" .listi="" .lists="" 7370="" 7380="" 7390="" 7400="" 7410="" 7420="" a="" multi-col="" td=""><td>FNparhel oage with a FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparh</td><td><pre>up("Eject <y n="">","Fi</y></pre></td><td>8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8260 ] 8270 NE 8280 PR de; "byt; code,0% 8300 : 8310 : 8320 DR 8310 : 8320 DR 8310 : 8320 DR 8310 :</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, {pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  oml FNcommand("ListSetup",0,25  oma FNcommand("ListPare",0,2  oma FNcommand("ListPooter",0,2  FNcommand("ListPare",0,0) FNcommand("ListBeater",0,0) FNcommand("ListPare",0,0) FNcommand("</td></setting);>   | FNparhel oage with a FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparh | <pre>up("Eject <y n="">","Fi</y></pre>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8260 ] 8270 NE 8280 PR de; "byt; code,0% 8300 : 8310 : 8320 DR 8310 : 8320 DR 8310 : 8320 DR 8310 :   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, {pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  oml FNcommand("ListSetup",0,25  oma FNcommand("ListPare",0,2  oma FNcommand("ListPooter",0,2  FNcommand("ListPare",0,0) FNcommand("ListBeater",0,0) FNcommand("ListPare",0,0) FNcommand(" |
| 5090 5100 5100 5120 base+1 5130 5140 5150 5160 5170 5180 5190 5210 5210 5210 5210 5210 5210 5220 5230 5240 5250 5260 5270 5280 5290 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5310 5320 5330 5330 5330 5330 5330 5330 533   | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS SWI SUBS CMP LDRNEB BLNE BNE .blank ADD CMP LDRNEB BLNE BNE .ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD B .do_footer LDRB BL LDRB BL LDRB BL LDRB BL CMP CMP CMP BEQ CMP SWI ADD CMP BEQ CMP BEQ CMP BEQ CMP CMP BEQ CMP CMP BEQ CMP CMP CMP CMP BEQ CMP   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9  r0,[r2],#1 "XOS_Write(" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop m r4,r5,wine r5,r4,r8 do_footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#eject]   | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6260 6270 } 6300 6310 6320 6330 6340 6440 6440 6450 6440 6450  | MOV B NOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,(r6],#1 r0,#32 got_setup read_setup read_setup red_setup r0,#ASC"" get_string r0,#ASC" is_a_num r0,#ASC" not_a_num r0,#ASC" not_a_num r0,#ASC"  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7276 t number of 7276 t number of 7276 t number of 7276 t number of 7280 page width 7280 >"Set margin 7390 >", "Set marg 7310 >", "Set marg 7310 >", "Set left m 7340 7350 .Lists 7340 <a <y="" eject="" href="mailto:settle=" mailto:settle="m&lt;/td&gt;&lt;td&gt;FNparhel of page with a FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNp&lt;/td&gt;&lt;td&gt;&lt;pre&gt;tp(" n="">","Fi     page eject") tp("Gutter <n>","Se     pl("Gutter <n>","Se     lines per page") tp("ColumnSize <n>") tp("Width <n>","Set     lines per page") tp("Width <n>","Set     in ("TopMargin <n>",     in ("HeaderMargin <n <n="" and="" colter")="" footer")="" header="" in="" text="" text")="" tp("bottommargin="" tp("eoftmargin="" tp("eoftommargin="" tp("footermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces</n></n></n></n></n></n></n></a>  | 8120 .w. 8130 8146 8150 8170 .l. 8180 8200 .c. 5) 8210 .c. 55) 82210 .c. 55) 8220 .c. 55) 8220 .c. 620 .c. 820 | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, {pc}  a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  oml FNcommand("ListSetup",0,25  oma FNcommand("ListPare",0,2  oma FNcommand("ListPooter",0,2  FNcommand("ListPare",0,0) FNcommand("ListBeater",0,0) FNcommand("ListPare",0,0) FNcommand("                               |  |  |
| 5090 5100 5100 5120 base+( 5130 5140 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5250 5260 5270 5280 5290 5390 5390 5390 5390 5390 5390 5390 53   | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWI SWIS ENE .blank ADD CMP LDRREB BLNE ENE SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD CMP BEQ SWI ADD CMP BEQ SWI ADD CMP BEQ SWI ADD BLT .blank_to_botto CMP BEQ SWI ADD BLT .blank_to_botto CMP BEQ SWI ADD BEQ LDRB BL   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop  mr4,r5 do_footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r4,r4,#1 blank_to_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#eject] r0,#true do_page_eject   | 6180 6190 ) 6200 6210 6220 6230 ) 6240 6250 6260 6270 63100 63100 63100 63100 63100 63100 6340 6350 6360 6370 6380 6390 6400 6410 6420 6430 6440 6450 6470 6480 6490 65500   | MOV B HALL STMFD MOV B STMFD MOV B STMFD MOV Set_string MOV Set_string ADD ADD ADD ADD LDRB CMP BEC CM | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup ro,#ASC""" get_string r0,#ASC""" get_string r0,#ASC""" not_a_num r0,#ASC""" not_a_num r0,#ASC"""  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 .List 7360 <setting); ")="" (optional<="" .list="" .listi="" .lists="" 7370="" 7380="" 7390="" 7400="" 7410="" 7420="" 7430="" 7440="" 7450="" a="" he="" multi-col="" td=""><td>FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of FNparhel</td><td><pre>ip("Eject <y n="">","Fi     page eject") ip("Gutter <n>","Se     i) ip("Gutter <n>","Se     i) ip("Gutter <n>","Se     ilines per page") ip("ColumnSize <n>" ') ip("Width <n>","Set     ilines per page") ip("Width <n>","Set     ilines     iner") ip("HeaderMargin <n <n="" and="" footer")="" header="" in="" inet="" ip("bottommargin="" ip("footermargin="" text")="">" crif\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crif\$ syntax\$+"</n></n></n></n></n></n></n></y></pre> "*ListSetup sets t ring output " "before the listin</td><td>8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 600 8240 8250 8260 .R. 8310 :. 8320 .R. 8310 :. 8320 .R. 8330 [0] 8340 8350 R\$31) 8360 8370 8380 ]</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands</td></setting);>   | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of FNparhel | <pre>ip("Eject <y n="">","Fi     page eject") ip("Gutter <n>","Se     i) ip("Gutter <n>","Se     i) ip("Gutter <n>","Se     ilines per page") ip("ColumnSize <n>" ') ip("Width <n>","Set     ilines per page") ip("Width <n>","Set     ilines     iner") ip("HeaderMargin <n <n="" and="" footer")="" header="" in="" inet="" ip("bottommargin="" ip("footermargin="" text")="">" crif\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crif\$ syntax\$+"</n></n></n></n></n></n></n></y></pre> "*ListSetup sets t ring output " "before the listin   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 600 8240 8250 8260 .R. 8310 :. 8320 .R. 8310 :. 8320 .R. 8330 [0] 8340 8350 R\$31) 8360 8370 8380 ]  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands  |
| 5090 5100 5100 5120 base+(-1) 5130 5140 5150 5160 5170 5180 5190 5200 5210 5210 5210 5210 5220 5330 5340 5350 5390 5310 5390 5400 5400 5430 5430  | CMP BGE MLA MAD MOV .show_pageloop3 LDRB BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BLNE BNE SWI ADD CMP LDRNEB BLNE BLT LDRNEB BLT LDRD BEQ SWI ADD B .do_footer LDRB BL  | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11 ;ine)*size r3,r9 r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop m r4,r5 do_footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r0,[wp,#fmarg] margin r0,#2 lead_foot r0,[wp,#fmarg] margin r0,#2 lead_foot r0,[wp,#fmarg]  | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6270 } 6280 6370 6310 6310 6320 6330 6340 6350 6370 6380 6390 6400 6410 6420 6430 6440 6450 6460 6470 6480 6490 65500  | MOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup r0,#ASC*" is_a_num r0,#ASC*" is_a_num r0,#ASC*9" is_a_num r0,#ASC*9" is_a_num r0,#ASC*9" is_a_num   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 "Set left m 7340 7350 .Lists 7360 <setting>]" 7370 7380 .Lists 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be</setting>  | FNparhel age with a FNparhel en columns' FNparhel printable FNparhel of column' FNparhel above head FNparhel in betweer FNparhel jin betweer FNparhel EQUS Setup Help EQUS EQUS EUSBETUS EUSS EUSS EUSS EUSS EUSS EUSS EUSS  | <pre>tp("Eject <!--/N-->","Fi a page eject") tp("Gutter <m>","Se t) tp("Gutter <m>","Se tlines per page") tp("Columnsize <m>") tp("Width <m>","Se tlines per page") tp("Width <m>","Se tlines tline</m></m></m></m></m></pre> | 8120 .w. 8130 8140 8150 8150 8150 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 60 8250 8260 l 8270 NE. 8280 PR. de; byc. 8290 SY. code, Ow. 8310 E. 8320 DE. 8330 [0] 8340 8350 8350 B. 8310 [0] 8340 8350 8350 B. 8350 B. 8360 8370 8380 ] 8360 8370 8380 ] 8390 ="   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands  FNcommand("Listing",1,1) FNcommand("ListSet",0,255)  FNcommand("ListSetup",0,25  com2 FNcommand("ListHeader",0,2 com3 FNcommand("ListPars",0,2 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListPars",1,1) EQUD 0  XT INT*ListAid assembled in ",0%-co BB" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$, help\$) PT pass EQUS ""+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS STRING\$(18-LENcom\$,CH EQUS crlf\$ "F FNalloc(size)   |
| 5090 5100 5100 5120 base+(  | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWI SWIS ENE .blank ADD CMP LDRMEB BLNE ENE SWI ADD CMP BLT .blank_to_botto CMP BEQ SWI ADD CMP BEQ SWI ADD CMP BEQ SWI ADD CMP BEQ CMP BEQ SWI ADD CMP BEQ CMP BEQ SWI ADD B .do_footer LDRB BL LDRB BL LDRB BL LDRB BL LDRB BL LDRB BEQ LDRB BEQ LDRB BEQ LDRB BEQ LDRB BEL Ado_page_eject  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2],#1 "XOS_WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop mm r4.r5 do_footer "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop mr r4.r6.#1 r0.[wp,#fmarg] margin r0.#2 head_foot r0.[wp,#fmarg] margin r0.#2 head_foot r0.[wp,#bmarg] margin margin r0.#2 head_foot r0.[wp,#bmarg] margin   | 6180 6190 7 6200 6210 6220 6230 7 6260 6270 7 6280 6290 6310 6310 6320 6310 6320 6310 6400 6410 6420 6430 6440 6450 6470 6480 6490 6510  | MOV B MOV MOV B MOV MOV B MOV  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r5],#1 r0,#32 got_setup red_setup ro,#ASC""" get_string r0,#ASC"" is_a_num r0,#ASC""   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set marg 7330 ,"Set left m 7340 7350 .Lists 7360 <setting>]", 7370 7380 .Lists 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be 7470</setting>  | FNparhel oage with a FNparhel of column's FNparhel of FNparhel  | <pre>tp("Eject <y n="">","Fi</y></pre>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 6200 .c. 6200 .c. 6300 .c. 6310 .c. 6320 .c. 63 | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) onl FNcommand("ListSetup",0,25 onn2 FNcommand("ListHeader",0,2 onn3 FNcommand("ListPare",0,2 FNcommand("ListPare",0,0) FNcommand("ListPare",0,0) FNcommand("ListPare",1,1) EQUD 0  KT INT"ListAid assembled in ";0%-co 88" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$,help\$) FT pass EQUS STRING\$(18-LENcom\$,CH EQUS ": "+help\$ EQUS crlf\$ " F FNalloc(size) loc-size   |
| 5090 5100 5120 base+(5130 5140 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5250 5260 5270 5280 5390 5310 5340 5340 5440 5440 5440 5440  | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWISS BNE .blank ADD CMP LDRNBB BLNE BNE SWI ADD CMP LDRNB BLNE BNE SWI ADD CMP LDRNB BLY BOT LDRB BLY BOT BEQ SWI ADD B .do_footer LDRB BL SWI ADD BL SWI ADD BL SWI ADD BL SWI ADD BL SWI   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9 r0,[r2],#1 "XOS_Write(" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 geveral show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop m" r4,r4,#1 blank_r0_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#fmarg] margin dont_page_eject r0,[wp,#bmarg] margin dont_page_eject  | 6180 6190 ) 6200 6210 62230 ) 6240 6250 6260 6270 ) 6380 6390 6310 6320 6330 6340 6350 6360 6370 6380 6410 6420 6430 6440 6450 6460 6470 6480 6490 6500  | MOV B HEAD NOV B HEAD  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,(r61,#1 r0,#32 got_setup read_setup read_setup r0,#ASC""" get_string r0,#ASC"" is_a_num r0,#ASC"9" is_a_num r0,#ASC"9" is_a_num r0,#ASC"9" is_a_num r0,#ASC"9" is_a_num r0,#ASC"9" is_a_setup   | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set marg 7330 ,"Set left m 7340 7350 .Lists 7360 <setting>]", 7370 7380 .Lists 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be 7470</setting>  | FNparhel oage with a FNparhel of column's FNparhel of FNparhel  | <pre>tp("Eject <!--/N-->","Fi a page eject") tp("Gutter <m>","Se t) tp("Gutter <m>","Se tlines per page") tp("Columnsize <m>") tp("Width <m>","Se tlines per page") tp("Width <m>","Se tlines tline</m></m></m></m></m></pre> | 8120 .w. 8130 8146 8150 8170 .l. 8180 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 8260 PR 6e; byt. 8260 PR 6e; byt. 8260 PR 6e; byt. 8310 EN 8 | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands  |
| 5090 5100 5100 5120 base+1 5130 5140 5150 5160 5170 5180 5190 5200 5210 5220 5230 5240 5250 5260 5260 5260 5270 5280 5280 5280 5280 5280 5280 5280 528  | CMP BGE MIAA MOV .show_pageloop3 LDRB SWI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD B .do_footer LDRB BL MOV BL LDRB BL BL MOV BL LDRB BL MOV BL LORB BL BL MOV BL LORB BL MOV BL LORB BL BL MOD BL ADD BL BL MOD BL BL BL BL BL ADD BL BL ADD BL BL BL BL ADD BL BL BL BL BL BL BL BL ADD BL   | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2].#1 "XOS.WriteC" r3.r3.#1 show.pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show.pageloop2 "XOS.NewLine" r4.r4.#1 r4.r8 show.pageloop "XOS.NewLine" r4.r4.#1 r4.r8 show.pageloop "XOS.NewLine" r4.r4.#1 r4.r8 show.pageloop "4.r6.#1 r6.r7 c0.[wp,#fmarg] margin r6.r6.#2 head_foot r0.[wp,#fmarg] margin r0.#2 head_foot r0.[wp,#eject) r0.#Tue do.page_eject c20080+12   | 6180 6190 } 6200 6210 6220 6230 } 6240 6270 } 6280 6270 } 6280 6370 6310 6320 6330 6340 6350 6360 6440 6410 6420 6430 6440 6450 6460 6470 6480 6490 6510 6510 6520 6530  | MOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,NSL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup red_setup red_setup ro,#ASC"" is_a_num r0,#ASC"" is_a_num r0,#ASC"" not_a_num r0,#ASC"" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting);" ")="" (optional="" .lists="" 7370="" 7380="" 7390="" 7400="" 7410="" 7420="" 7430="" 7440="" 7450="" 7460="" 7470="" a="" be="" ers="" g.="" he="" i<="" it="" may="" multi-col="" td=""><td>FNparhel oage with a FNparhel of column's FNparhel of FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparh</td><td><pre>up("Eject <y n="">","Fi i page eject") up("Gutter <n>","Se lines per page") up("Gutter <n>","Se lines per page") up("ColumnSize <n>"," ') up("Width <n>","Set lines yer up("HeaderMargin <n ')="" <n="" up("eftmargin="" up("footermargin="" up("headermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces up of a file." crlf\$ syntax\$+"<filename>  "*Listsetup sets t rring output " "before the listin et the printer " "font etc. Charact '""" or as ASCII</filename></n></n></n></n></n></y></pre></td><td>8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 .R. 8310 .R. 8320 .R. 8310 .R. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8340 (0. 8350 (0. 8350 (0. 8360 (0. 8360 (0. 8370 (0. 8360 (0. 8370 (0. 8370 (0. 8370 (0. 8380 (0. 8370 (0. 8380 (0. 8370 (</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) SWI FNcommand("ListSetup",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI SWI FNcommand("SWI ListAid",0,05 SWI SWI SWI SWI SWI SWI SWI SWI SWI SWI</td></setting);">  | FNparhel oage with a FNparhel of column's FNparhel of FNparhel of column's FNparhel of column's FNparhel of column's FNparhel of FNparh | <pre>up("Eject <y n="">","Fi i page eject") up("Gutter <n>","Se lines per page") up("Gutter <n>","Se lines per page") up("ColumnSize <n>"," ') up("Width <n>","Set lines yer up("HeaderMargin <n ')="" <n="" up("eftmargin="" up("footermargin="" up("headermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces up of a file." crlf\$ syntax\$+"<filename>  "*Listsetup sets t rring output " "before the listin et the printer " "font etc. Charact '""" or as ASCII</filename></n></n></n></n></n></y></pre>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 .R. 8310 .R. 8320 .R. 8310 .R. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8330 (0. 8340 (0. 8350 (0. 8350 (0. 8360 (0. 8360 (0. 8370 (0. 8360 (0. 8370 (0. 8370 (0. 8370 (0. 8380 (0. 8370 (0. 8380 (0. 8370 ( | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) SWI FNcommand("ListSetup",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI FNcommand("ListPare",0,25 SWI SWI FNcommand("SWI ListAid",0,05 SWI   |
| 5090 5100 5120 base+(5130 5140 5140 5150 5160 5170 5180 5190 5200 5210 5220 5230 5240 5240 5240 5250 5260 5270 5280 5390 5390 5390 5390 5390 5340 5350 5360 5370 5380 5350 5360 5440 5440 5450 5460 5460 5470 5480  | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWIS .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD CMP BEQ LDRB BBC ADD B .do_footer LDRB BL MOV BL LDRB CMP BEQ LDRB BL SWI ADD SMI ADD B .do_footer SWI ADD SMI ADD SMI ADD SWI ADD B .do_footer SWI ADD SMI A | r2.r6,r8,r4 r2.r10 blank r2.r9,r2.r11; ine)*size r3.r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 geveral show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop mn r4,r5 do footer "XOS_NewLine" r4,r4,#1 r4,r4,#1 blank_to_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#fsucc] r0,fwp,#bmarg  margin dot_page_eject r0,[wp,#bmarg] margin dot_page_eject 620108+12 t(sp)!,(r2-r9,link)   | 6180 6190 7 6200 6210 6220 6230 7 6260 6270 6270 6280 6290 6310 6320 6310 6320 6310 6320 6330 6340 6350 6360 6370 6380 6400 6410 6420 6430 6410 6420 6430 6550 6550  | MOV B MOV MOV B MOV  | r4,#0 set_string (sp)!, (r1-r11, link r4,#1 set_string (sp)!, (r1-r11, link r4,#2 init_com r8, wp, #headers r8, r8, r4, ASL #8 r9, wp, #lengths r6, wp, #command r0, [r6], #1 r0, #32 got_setup read_setup red_setup red_setup r0, #ASC""" get_string r0, #ASC""" get_string r0, #ASC""" is_a_num r0, #ASC"9" is_a_num r0, #ASC"9" is_a_num r0, f81,#1 read_setup r0, #10 r1,r6,#1 "XOS_ReadUnsigned" bad_setup  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 , "Set width 7280 page width' 7290 "Set margin 7300 >", "Set marg 7310 >", "Set marg 7310 >", "Set marg 7320 c, "Set marg 7330 , "Set left m 7340 7350 .Lists 7360 <a href="mailto:setting">setting</a> 7370 7380 .Lists 7360 a multi-col 7400 7410 .Lists 7450 he (optional 7460 g. It may be 7470 ers may be i "   | FNparhel of page with a FNparhel of Columns' FNparhel of Column' FNparhel of Column' FNparhel of FNpar | <pre>up("Eject <y n="">","Fi     page eject") up("Gutter <n>","Se     i) up("Gutter <n>","Se     i) up("Gutter <n>","Se     ilines per page") up("Gutter <n>","Se     ilines per page") up("Width <n>","Set     ilines per page") up("HeaderMargin <n <n="" and="" footer")="" in="" text="" text")="" up("eoftdamargin="" up("headermargin="">" crlf\$ syntax\$+"[-par_name  "*Listing produces up of a file." crlf\$ syntax\$+"<filename>  "*ListSetup sets tring output " "before the listin     inter the printer " "font etc. Charact     in"" or as ASCII "codes. For exampl</filename></n></n></n></n></n></n></n></n></n></y></pre>  | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8260 .l. 8270 NE 8280 PR de; "byt. 8290 SY, code, 0% 8300 EN, 8310 8320 DE, 8330 [0] 8340 8350 8311) 8360 8370 8380 ] 8440 8410 DE, 8420 al. 8430 =a. 8440 al. 8430 =a.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands     FNcommand("Listing",1,1)     FNcommand("ListSet",0,255) ml FNcommand("ListSetup",0,25  com3 FNcommand("ListSetup",0,25  com3 FNcommand("ListPare",0,2      FNcommand("ListPare",0,0)     FNalloc(size) loc+size lloc+size FNcommand(com\$,min,max)  PT pass     FNkext(com\$)  |
| 5090 5100 5100 5120 base+(-1) 5130 5140 5150 5160 5170 5180 5190 5200 5210 5210 5210 5210 5210 5220 5230 5240 5250 5260 5270 5280 5290 5310 5320 5310 5320 5310 5320 5340 5350 5360 5370 5380 5390 5400 5410 5420 5430 5440 5450 5460 5470  | CMP BGE MLA MOV .show_pageloop3 LDRB SNI SUBS ENE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BLNE BNE SWI ADD CMP LDRNEB BLNE BLT LDRD BEQ LDRB BL MOV BL LDRB BL MOV BL LDRB BL MOV BL LDRB BL BL MOD ADD BL LDRB BL  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2],#1 "XOS_WriteC" r3.r3,#1 show_pageloop3 r6.r6,#1 r6.r7 re,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 show_pageloop mm r4.r5 show_pageloop mr4.r5 show_pageloop "XOS_NewLine" r4.r4.#1 blank_r0_bottom r0,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#eject] r0,#true do_page_eject dont_page_eject &20108-12 t(sp)!,(r2-r9,link) r9,#0   | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6260 6270 } 6300 6310 6320 6330 6340 6350 6360 6370 6380 6390 6400 6410 6410 6420 6430 6450 6460 6470 6480 6490 6550 6550  | MOV B B MOV B MOV B B MOV B MOV B MOV B B MOV B MOV B B B B B B B B B B B B B B B B B B B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,wf,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup r0,#ASC*" is_a_num r0,#ASC*" is_a_num r0,#ASC*" is_a_num r0,#ASC*9" is_a_num  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 ("Set left m 7340 7350 .Lists 7360 (setting)! 7370 7380 .Listi 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 7410 .tists 7470 ers may be i 7470 ers may be i 7480 e: *ListSette   | FNparhel oage with a service of the  | <pre>up("Eject <!--/N-->","E a page eject") up("Gutter <m>","Se lines per page") up("Gutter <m>","Se lines per page") up("Gutter <m>","Se lines per page") up("Width <m "'fer="" page="" page<="" per="" td=""><td>8120 .w. 8130 8140 8150 8170 .l. 8180 8199 8203 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 .R. 8210 .c. 8290 PR 4e," byt. 8290 SY, code, 0% 8300 E. 8310 :. 8320 E. 8330 [0] 8340 8350 R\$31) 8360 8370 8380 ] 8390 =" 8440 E. 8440 E. 8440 E. 8440 E.</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) om2 FNcommand("ListBeader",0,2 om3 FNcommand("ListBeader",0,2 om3 FNcommand("ListPars",0,2 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListPars",1,1) EQUD 0  XT INT*ListAid assembled in ";0%-co BB" S "OS_File",10,"%.ListAid",&amp;FFA, D F FNparhelp(com\$, help\$) PT pass EQUS ""+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS STRING\$(18-LENcom\$,CH EQUS crif\$ " F FNalloc(size) loc+ssize loc+ssize loc+ssize F FNcommand(com\$,min,max) PT pass Filext(com\$) EQUD EVAL(com\$)</td></m></m></m></m></m></m></m></m></m></m></m></pre>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8199 8203 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 .R. 8210 .c. 8290 PR 4e," byt. 8290 SY, code, 0% 8300 E. 8310 :. 8320 E. 8330 [0] 8340 8350 R\$31) 8360 8370 8380 ] 8390 =" 8440 E. 8440 E. 8440 E. 8440 E.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) om2 FNcommand("ListBeader",0,2 om3 FNcommand("ListBeader",0,2 om3 FNcommand("ListPars",0,2 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListPars",1,1) EQUD 0  XT INT*ListAid assembled in ";0%-co BB" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$, help\$) PT pass EQUS ""+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS STRING\$(18-LENcom\$,CH EQUS crif\$ " F FNalloc(size) loc+ssize loc+ssize loc+ssize F FNcommand(com\$,min,max) PT pass Filext(com\$) EQUD EVAL(com\$)   |
| 5090 5100 5120 5120 5120 5120 5140 5140 5150 5160 5170 5180 5190 5200 5210 5220 5230 5240 5250 5260 5270 5280 5280 5280 5280 5280 5280 5280 528 | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWIS .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD CMP BEQ LDRB BBC ADD B .do_footer LDRB BL MOV BL LDRB CMP BEQ LDRB BL SWI ADD SMI ADD B .do_footer SWI ADD SMI ADD SMI ADD SWI ADD B .do_footer SWI ADD SMI A | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ; ine) *size r3.r9  r0.[r2],#1 "XOS WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r5 do_footer "XOS_NewLine" r4.r4.#1 show_pageloop mm r4.r5 do_footer "XOS_NewLine" r4.r4.#1 r4.r5 do_footer "XOS_NewLine" r4.r8.p1 do_footer "XOS_NewLine" r4.r9.f0 margin margin c0.f0,[wp,#fmarg] margin margin dont_page_eject c2000e12 t (sp)!,(r2-r9,link) r9.f0 r10,f0  | 6180 6190 6190 6210 6220 6230 6230 6250 6260 6270 6300 6310 6320 6330 6340 6350 6360 6370 6380 6390 6400 6410 6420 6430 6450 6470 6480 6490 65500 6550 6550  | MOV B MOV MOV B MOV  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup red_setup red_setup red_setup ro,#ASC""" get_string r0,#ASC""" is_a_num r0,#ASC"" is_a_num r0,#ASC"9" is_a_num r0,#ASC" | 7240 ollow each r 7250 t gap betwee 7260 t number of 7260 t number of 7270 7270 "Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7360 <setting); "="" ")="" (optional="" *listsett="" .listi="" .lists="" 7370="" 7380="" 7390="" 7400="" 7410="" 7420="" 7430="" 7440="" 7450="" 7460="" 7470="" 7480="" 7490<="" a="" be="" e:="" ers="" g.="" he="" i="" it="" may="" multi-col="" td=""><td>FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of FNpa</td><td><pre>ip("Eject <!--NN","Fi ip Tage eject") ip("Gutter <n-->","Se ip("Gutter <n>","Se lines per page") ip("ColumnSize <n>"," ip("Width <n>","Set lip("TopMargin <n>"," ip("Width <n>","Set ip("HeaderMargin <n <n="" and="" footer")="" ip="" ip("bottommargin="" ip("headermargin="" self="" text")="" the="">" crif\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crif\$ syntax\$+"sfilename&gt;  "*ListSetup sets t "hig output" "before the listin iet the printer " "font etc. Charact i """" or as ASCII "codes. For exampl """</n></n></n></n></n></n></pre></td><td>8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 620 .c</td><td>ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) oml FRCommand("ListSetup",0,25 om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,0) FRCommand("ListFare",0,0) FRCommand("ListSave",1,1) EQUD 0  KT INT"ListAid assembled in ";0%-co 88" S "OS_File",10,"%.ListAid",&amp;FFA, D F FNparhelp(com\$,help\$) FF pass EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS ": "+help\$ EQUS crif\$ " F FNalloc(size) loc+ssize lloc-size F FRCommand(com\$,min,max) PT pass FNtext(com\$) EQUD EVAL(com\$) EQUD min</td></setting);> | FNparhel oage with a FNparhel of columns' FNparhel of column' FNparhel of FNpa | <pre>ip("Eject <!--NN","Fi ip Tage eject") ip("Gutter <n-->","Se ip("Gutter <n>","Se lines per page") ip("ColumnSize <n>"," ip("Width <n>","Set lip("TopMargin <n>"," ip("Width <n>","Set ip("HeaderMargin <n <n="" and="" footer")="" ip="" ip("bottommargin="" ip("headermargin="" self="" text")="" the="">" crif\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crif\$ syntax\$+"sfilename&gt;  "*ListSetup sets t "hig output" "before the listin iet the printer " "font etc. Charact i """" or as ASCII "codes. For exampl """</n></n></n></n></n></n></pre>   | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8200 .c. 55) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 620 .c | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FRCommand("Listing",1,1) FRCommand("ListSet",0,255) oml FRCommand("ListSetup",0,25 om2 FRCommand("ListSetup",0,25 om3 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,2 FRCommand("ListFooter",0,0) FRCommand("ListFare",0,0) FRCommand("ListSave",1,1) EQUD 0  KT INT"ListAid assembled in ";0%-co 88" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$,help\$) FF pass EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS ": "+help\$ EQUS crif\$ " F FNalloc(size) loc+ssize lloc-size F FRCommand(com\$,min,max) PT pass FNtext(com\$) EQUD EVAL(com\$) EQUD min   |
| 5090 5100 5100 5120 base+(-1) 5130 5140 5150 5160 5170 5180 5190 5200 5210 5210 5210 5210 5210 5220 5230 5240 5250 5260 5270 5280 5290 5310 5320 5310 5320 5310 5320 5340 5350 5360 5370 5380 5390 5400 5410 5420 5430 5440 5450 5460 5470  | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWI SWIS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BUT .blank_to_botto CMP BEQ SWI ADD CMP BEQ SWI ADD LDRB BL MOV LDRB BL LDRB BL LDRB BL MOV BL LDRB BL MOV BL LDRB BL MOV BL LDRB BL LDRB BL MOV MOV MOV MOV  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r2].#1 "XOS WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r6.#1 r6.r7 r0.[wp.#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r8 show_pageloop0 mr4.r5 do_footer "XOS_NewLine" r4.r4.#1 blank_to_bottom r0.[wp.#fmarg] margin r0.#2 head_foot r0.[wp.#fmarg] margin do_page_eject r0.[wp.#bmarg] margin dont_page_eject cont_page_eject r0.[wp.#bmarg] margin dont_page_eject cont_page_eject cont_page_eject r0.[wp.#bmarg] margin dont_page_eject r0.[wp.#bmarg] r0.ficer-r0. | 6180 6190 } 6200 6210 6220 6230 } 6200 6270 6280 6270 6300 6310 6310 6320 6330 6340 6350 6360 6370 6380 6410 6420 6400 6410 6420 6550 6560 6570  | MOV B NOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,wf,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup r0,#ASC*" is_a_num r0,#ASC*" is_a_num r0,#ASC*" is_a_num r0,#ASC*9" is_a_num  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width' 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 ("Set left m 7340 7350 .Lists 7360 (setting)! 7370 7380 .Listi 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 7410 .tists 7470 ers may be i 7470 ers may be i 7480 e: *ListSette   | FNparhel age with a FNparhel column's FNparhel printable FNparhel of column's FNparhel down bear fNparhel ') FNparhel above head FNparhel in betweer FNparhel jin betweer FNparhel EOUS Set_Syntax FNtext(s Setup_Help EOUS Setup_Help EOUS LOUS LOUS EOUS LOUS EOUS EOUS EOUS EOUS EOUS EOUS EOUS E  | tp("Eject <\(Y\N\)^","s i page eject") ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("HeaderMargin <\(n\) in header and text") ip("FooterMargin <\(n\) ip("FooterMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("LeftMargin <\(n\)" crlf\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crlf\$ syntax\$+" <filename>  "*ListSetup sets t iring output " "before the listing ive the printer " "font etc. Charact in""" or as ASCII "codes. For exampl' crlf\$ ix</filename>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8199 8203 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 .R. 8210 .c. 8290 PR 4e," byt. 8290 SY, code, 0% 8300 E. 8310 :. 8320 E. 8330 [0] 8340 8350 R\$31) 8360 8370 8380 ] 8390 =" 8440 E. 8440 E. 8440 E. 8440 E.  | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands FNCommand("Listing",1,1) FNcommand("ListSet",0,255) DM1 FNCommand("ListSet",0,255) DM2 FNCommand("ListHeader",0,2 DM3 FNCommand("ListPars",0,2 FNCommand("ListPars",0,0) FNCommand("ListPars",0,0) FNCommand("ListPars",1,1) EQUD 0  XT INT*ListAid assembled in ";0%-co ass "OS_File",10,"%.ListAid",&FFA, D F FNPArhelp(com\$,help\$) PT pass EQUS ""+com\$ EQUS STRIMG\$(18-LENcom\$,CH EQUS STRIMG\$(18-LENcom\$,CH EQUS STRIMG\$(18-LENcom\$,CH EQUS crif\$ " F FNalloc(size) loc+ssize lloc+size F FNCommand(com\$,min,max) PT pass FNtext(com\$) EQUD EVAL(com\$) EQUB min EQUB 0   |
| 5090 5100 5120 base+(5130 5140 5140 5150 5160 5170 5180 5200 5210 5220 5230 5240 5240 5240 5250 5260 5270 5280 5390 5390 5390 5390 5390 5340 5440 5450 5470 5480 5470 5480 5510 5520 5520 5520 5520 5520 5520 552   | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWIS SNE ENE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD LDRB BLO BB .do_footer LDRB BL LDRB BL LDRB BL LDRB BL LDRB SWI ADD LDRB CMP BEQ LDRB BL LDRB CMP BEQ LDRB SWI LDRB CMP BEQ LDRB SWI ADD LDRB LDRB LDRB BL LDRB LDRB CMP BEQ LDRB SWI LDRB ADD MOV MOV LDRB ADD   | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ; ine) *size r3.r9  r0.[r2],#1 "XOS WriteC" r3.r3.#1 show_pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4.r4.#1 r4.r5 do_footer "XOS_NewLine" r4.r4.#1 show_pageloop mm r4.r5 do_footer "XOS_NewLine" r4.r4.#1 r4.r5 do_footer "XOS_NewLine" r4.r8.p1 do_footer "XOS_NewLine" r4.r9.f0 margin margin c0.f0,[wp,#fmarg] margin margin dont_page_eject c2000e12 t (sp)!,(r2-r9,link) r9.f0 r10,f0  | 6180 6190 } 6200 6210 62230 } 6200 6270 } 6280 6270 } 6380 6310 6310 6310 6310 6310 6310 6310 6350 6370 6380 6370 6380 6390 6410 6420 6400 6410 6420 6330 6410 6450 6550 6550 6550   | MOV B B ListHeader STMFD MOV B B ListFooter STMFD MOV B B ListFooter STMFD MOV B B LISTFOOTER BE B LISTFOOTER BE B B B B B B B B B B B B B B B B B   | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup read_setup red_setup red_setup red_setup ro,#ASC""" get_string r0,#ASC""" is_a_num r0,#ASC"" is_a_num r0,#ASC"9" is_a_num r0,#ASC" | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set marg 7330 "Set left m 7340 7350 .Lists 7360 <setting>]" 7370 7380 .Lists 7390 a multi-col 7400 7410 .Listi 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be 7470 ers may be i " "480 e: *ListSett 7490 7500 .ListS</setting>   | FNparhel age with a FNparhel column's FNparhel printable FNparhel of column's FNparhel down bear fNparhel ') FNparhel above head FNparhel in betweer FNparhel jin betweer FNparhel EOUS Set_Syntax FNtext(s Setup_Help EOUS Setup_Help EOUS LOUS LOUS EOUS LOUS EOUS EOUS EOUS EOUS EOUS EOUS EOUS E  | <pre>ip("Eject <!--NN","Fi ip Tage eject") ip("Gutter <n-->","Se ip("Gutter <n>","Se lines per page") ip("ColumnSize <n>"," ip("Width <n>","Set lip("TopMargin <n>"," ip("Width <n>","Set ip("HeaderMargin <n <n="" and="" footer")="" ip="" ip("bottommargin="" ip("headermargin="" self="" text")="" the="">" crif\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crif\$ syntax\$+"sfilename&gt;  "*ListSetup sets t "hig output" "before the listin iet the printer " "font etc. Charact i """" or as ASCII "codes. For exampl """</n></n></n></n></n></n></pre>   | 8120 .w. 8130 8140 8150 8160 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 60 8250 8260 le 8260 le 8260 le 8260 le 8260 PR de; betal   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands     FNcommand("Listing",1,1)     FNcommand("ListSet",0,255) commands     FNcommand("ListSet",0,255) command("ListSetup",0,25 command("ListPare",0,25 command("ListPare",0,0)     FNcommand("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,0)     FOS_File",10,"%.ListAid",2FFA,0 command("ListPare",0,2  |
| 5090 5100 5100 5120 base+1 5130 5140 5150 5160 5170 5180 5190 5200 5200 5210 5220 5230 5240 5250 5260 5270 5280 5290 520 520 520 520 520 520 520 520 520 52   | CMP BGE MLA MOV .show_pageloop3 LDRB SNI SUBS BNE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD B .do_footer LDRB BL MOV BL LDRB BL BL MOV BL LDRB BL LDRB BL MOV BL LDRB BL LDRB BL MOV BL LDRB BL ADD STRB  | r2.r6.r8.r4 r2.r10 blank r2.r9.r2.r11 ;ine)*size r3.r9 r0.[r1].#1 "XOS WriteC" r3.r3.#1 show.pageloop3 r6.r6.#1 r6.r7 r0.[wp,#gutter] several show.pageloop2 "XOS.NewLine" r4.r4.#1 r4.r8 show.pageloop "MOS.NewLine" r4.r4.#1 r4.r8 show.pageloop "AUS.NewLine" r4.r4.#1 r4.r8 show.pageloop "AUS.NewLine" r4.r4.#1 r6.p0 r0.[wp,#fmarg] margin r0.[wp,#fmarg] margin r0.[wp,#gett] co.[wp,#gett] co.[wp,#gett] co.[wp,#gett] r0.[wp,#gett] r0.[wp,#gett] r1.r0.[wp,#pageno] r0.[wp,#gageno] r0.[wp,#gageno] r0.[wp,#pageno] r0.[wp,#pageno]  | 6180 6190 } 6200 6210 6220 6230 } 6240 6250 6270 } 6280 6390 6310 6310 6310 6310 6310 6310 6310 631  | MOV B  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,NSL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup red_setup ro,#ASC""" get_string r0,#ASC""" is_a_num r0,#ASC""" is_a_num r0,#ASC""" is_a_num r0,#ASC""" is_a_num r0,#ASC"" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ASC" is_a_num r0,#ISC" is_a_num r0,#IC,#I red_setup r0,#IC,#I red_setup r0,#IC,#I  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7350 a multi-col 7400 7410 .Lists 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be 7470 ers may be i 7480 e: *ListSett 7490 7500 .Lists  | FNparhel age with a FNparhel column's FNparhel printable FNparhel of column's FNparhel down bear fNparhel ') FNparhel above head FNparhel in betweer FNparhel jin betweer FNparhel EOUS Set_Syntax FNtext(s Setup_Help EOUS Setup_Help EOUS LOUS LOUS EOUS LOUS EOUS EOUS EOUS EOUS EOUS EOUS EOUS E  | tp("Eject <\(Y\N\)^","s i page eject") ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("HeaderMargin <\(n\) in header and text") ip("FooterMargin <\(n\) ip("FooterMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("LeftMargin <\(n\)" crlf\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crlf\$ syntax\$+" <filename>  "*ListSetup sets t iring output " "before the listing ive the printer " "font etc. Charact in""" or as ASCII "codes. For exampl' crlf\$ ix</filename>   | 8120 .w. 8130 8140 8150 8170 .l. 8180 8190 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8230 8240 8250 8260 ] 8270 NE 8280 PR de; byterior of the serior of the ser | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1, (pc) a_commands FNcommand("Listing",1,1) FNcommand("ListSet",0,255) oml FNcommand("ListSetup",0,25 om2 FNcommand("ListHeader",0,2 om3 FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListPars",0,0) FNcommand("ListSave",1,1) EQUD 0  KT INT"ListAid assembled in ";0%-co 8s" S "OS_File",10,"%.ListAid",&FFA, D F FNparhelp(com\$,help\$) FT pass EQUS "-"+com\$ EQUS "-"+com\$ EQUS STRING\$(18-LENcom\$,CH EQUS ": "+help\$ EQUS crlf\$ " F FNalloc(size) loc+size lloc+size F FNcommand(com\$,min,max) FT pass EQUS EVAL(com\$) EQUB min EQUB o EQUB min EQUB 0 EQUB max  |
| 5990 5100 5120 base+(   | CMP BGE MLA MOV .show_pageloop3 LDRB SWI SWIS SNE ENE .blank ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP LDRNEB BLNE BNE SWI ADD CMP BEQ SWI ADD LDRB BLO BB .do_footer LDRB BL LDRB BL LDRB BL LDRB BL LDRB SWI ADD LDRB CMP BEQ LDRB BL LDRB CMP BEQ LDRB SWI LDRB CMP BEQ LDRB SWI ADD LDRB LDRB LDRB BL LDRB LDRB CMP BEQ LDRB SWI LDRB ADD MOV MOV LDRB ADD   | r2,r6,r8,r4 r2,r10 blank r2,r9,r2,r11; ine)*size r3,r9  r0,[r2],#1 "XOS_WriteC" r3,r3,#1 show_pageloop3 r6,r6,#1 r6,r7 r0,[wp,#gutter] several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r8 show_pageloop maryin r6,r6,#1 r6,r7 several show_pageloop2 "XOS_NewLine" r4,r4,#1 r4,r4,#1 blank_to_bottom r6,footer "XOS_NewLine" r4,r4,#1 blank_to_bottom r6,[wp,#fmarg] margin r0,#2 head_foot r0,[wp,#fmarg] margin dont_page_eject r0,[wp,#bmarg] margin dont_page_eject 420108+12 t (sp)!,(r2-r9,link) r9,#0 r10,#0 r7,r11 r0,[wp,#pageno] r0,r0,#1   | 6180 6190 ) 6200 6210 6220 6230 ) 6200 6270 6250 6260 6270 ) 6300 6310 6320 6330 6340 6350 6360 6370 6380 6410 6420 6430 6450 6460 6470 6480 6490 6500 6550 6550 6550 6550   | MOV B M MOV B M MOV B M M M M M M M M M M M M M M M M M M  | r4,#0 set_string (sp)!,(r1-r11,link r4,#1 set_string (sp)!,(r1-r11,link r4,#2 init_com r8,wp,#headers r8,r8,r4,ASL #8 r9,wp,#lengths r6,wp,#command r0,[r6],#1 r0,#32 got_setup red_setup red_setup ro,#ASC'*" is_a_num r0,#ASC'*" is_a_num r0,#ASC'9" is_a_num r0,#ASC'9" is_a_num r0,#ASC'8" Not_a_num r0,#ASC'8" Not_a_num r0,#ASC'8" r0,#ASC'8" sed_setup r0,#C,#I r2,#I red_setup r0,#I r2,#I r2,#I r2,#I r2,#I red_setup r6,r1 r2,[r8],#I red_setup r6,r1 r2,[r8],#I red_setup r0,[r6],#I  | 7240 ollow each r 7250 t gap betwee 7260 t number of 7270 ,"Set width 7280 page width 7290 "Set margin 7300 >","Set marg 7310 >","Set marg 7320 >","Set left m 7340 7350 .Lists 7350 a multi-col 7400 7410 .Lists 7420 ") 7430 7440 .Lists 7450 he (optional 7460 g. It may be 7470 ers may be i 7480 e: *ListSett 7490 7500 .Lists  | FNparhel age with a FNparhel column's FNparhel printable FNparhel of column's FNparhel down bear fNparhel ') FNparhel above head FNparhel in betweer FNparhel jin betweer FNparhel EOUS Set_Syntax FNtext(s Setup_Help EOUS Setup_Help EOUS LOUS LOUS EOUS LOUS EOUS EOUS EOUS EOUS EOUS EOUS EOUS E  | tp("Eject <\(Y\N\)^","s i page eject") ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Gutter <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Length <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("Width <\(n\)","Se i)ip("HeaderMargin <\(n\) in header and text") ip("FooterMargin <\(n\) ip("FooterMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("EottoMargin <\(n\) ip("LeftMargin <\(n\)" crlf\$ syntax\$+"[-par_name  "*Listing produces ig of a file." crlf\$ syntax\$+" <filename>  "*ListSetup sets t iring output " "before the listing ive the printer " "font etc. Charact in""" or as ASCII "codes. For exampl' crlf\$ ix</filename>   | 8120 .w. 8130 8146 8150 8170 .l. 8180 8200 .c. 5) 8210 .c. 55) 8220 .c. 55) 8220 .c. 55) 8220 .c. 8240 8250 8240 8250 8240 .l. 8220 .l. 8230 .l. 8330 .l. 8330 .l. 8340 .l. 8340 .l. 8350 .l. 8350 .l. 8340 .l. 8440 .l. 8440 .l. 8440 .l. 8440 .l. 8440 .l. 8450 .l. 8470 .l. 8480 8490 8500 8510   | ritten_hf MOV r0,#10 SWI "XOS_BPut" LDMFD (sp)1,(pc) a_commands = FNcommand("Listing",1,1) FNcommand("ListSet",0,255) ml FNcommand("ListSetup",0,25 cm2 FNcommand("ListFooter",0,2 cm3 FNcommand("ListPars",0,0) FNoormand("ListPars",0,0) FNoormand("ListPars",0,255) FNoorma |

| 8540 EQUD EVAL(com\$+"_Help")  | 980 y=B*x   | 340 MOV R14,R0   | 29Ø x=3  |
|--|---|--|--|
| 8550 ]<br>8560 =0  | 990 x=x1<br>1000 NEXT   | 350 LDR read, Screen<br>360 LDR write, Screen+4  | 300 y=4<br>310 vx=5  |
| 8570 :   | 1010 N%=0   | 37Ø MOV R12, #(32Ø*256/(1Ø*4*4))   | 320 vy=6   |
| 8580 DEF FNtext(text\$)<br>8590 (OPT pass  | 1020 REPEAT<br>1030 x1=1+y-A*x*x  | 380 .copy LDMIA (read)!,(RØ-R9)<br>390 STMIA (write)!,(RØ-R9)                            | 330 off=7<br>340 screen=8  |
| 8600 EQUS text\$   | 1040 y=B*x  | 400 LDMIA (read)!, (R0-R9)   | 350 colour=9   |
| 8610 EQUB 0<br>8620 ALIGN  | 1050 x=x1<br>1060 px=x*xs-xc  | 410 STMIA (write)!, (RØ-R9)<br>420 LDMIA (read)!, (RØ-R9)                                | 360 table=10<br>370 count=11   |
| 8630 ]   | 1070 py=y*ys-yc   | 430 STMIA (write)!,(RØ-R9)   | 380 link=14  |
| 8640 =0  | 1080 IF x>xmin AND y>ymin AND x <xmax an<br="">D y<ymax 69,px,py<="" n%="N%+1:PLOT" td=""><td>440 LDMIA (read)!, (R0-R9)<br/>450 STMIA (write)!, (R0-R9)</td><td>390 pc=15<br/>400 FOR pass%=0 TO 2 STEP 2</td></ymax></xmax> | 440 LDMIA (read)!, (R0-R9)<br>450 STMIA (write)!, (R0-R9)                                | 390 pc=15<br>400 FOR pass%=0 TO 2 STEP 2   |
| Listing 6  | 1090 UNTIL N%=maxpoints OR INKEY-17   | 460 SUBS R12,R12,#1  | 410 P%=code%   |
| Disting 0  | 1100 ENDPROC<br>1110 :  | 470 BNE copy<br>480 LDR read, Screen   | 420 [OPT pass%<br>430 .init ADR table, Table   |
| 10 REM >Henon attractor (Info 6)   | 1120 DEF PROCchoose   | 490 LDR write, Screen+4  | 450 LDR count, Num<br>460 LDR R1, Rnd1   |
| 20 REM By Gareth Eley<br>30 REM For BBC B/B+/M/C/B/A   | 1130 size%=200<br>1140 X%=scale/2   | 500 LDR R7, Seed<br>510 LDR R8, Xor  | 470 LDR R2,Rnd2  |
| 40 REM (c) BAU November 1991   | 1150 Y%=scale/2<br>1160 ox%=0:oy%=0:os%=0   | 520 MOV num, R14<br>530 .pickx FNrnd(9)  | 480 LDR x,Xpos<br>490 LDR y,Ypos   |
| 50 :<br>60 MODE 0:arc=(HIMEM>&10000)   | 1170 IF arc MOUSE TO X%,Y%  | 540 CMP RØ,#320  | 500 .loop ADD R1,R1,R1,LSL #2  |
| 70 ON ERROR GOTO 160<br>80 PROCsetup   | 1180 GCOL 3,1<br>1190 oxmin=xmin  | 550 BGE pickx<br>560 MoV x,R0  | 510 ADD R2,R2,R2,LSL #2<br>520 MOV vx,R1,LSR #16   |
| 90 PROCparams  | 1200 oymin=ymin   | 570 FNrnd(8)   | 530 SUB vx,vx,#128<<8  |
| 100 REPEAT<br>110 PROCplot(X,Y)  | 1210 done=FALSE<br>1220 REPEAT  | 580 MOV У, RØ<br>590   | 540 MOV  |
| 120 PROCchoose   | 1230 IF X%<>ox% OR Y%<>oy% OR size%<>os   | 600 ADD addr, read, y, ASL #6  | 560 MUL RØ, vx, vx   |
| 130 UNTIL FALSE<br>140 END   | % PROCredraw<br>1240 PROCgetpos   | 610 ADD addr,addr,y,ASL #8<br>620 LDRB col,[addr,x]!                                     | 570 MLA R0, VY, VY, R0<br>580 CMP R0, #1<<30   |
| 150 :  | 1250 IF Z=1 AND size%>10 size%=size%-4<br>1260 IF Z=4 AND size%<=scale size%=size   | 630 \ CMP col,#0<br>640 \ BEQ next   | 590 BHI loop<br>600 CMP R0,#1<<16  |
| 160 IF ERR=17 AND INKEY-2 MODE 0:END<br>170 IF rec PROCrec(X%-size%,Y%-size%,s   | %+4   | 650 .pickd FNrnd(2)  | 610 BLO loop   |
| ize%*2,size%*2):rec=FALSE  | 1270 IF Z=2 PROCnewlimits<br>1280 IF INKEY\$(0)="R" PROCinitxy:PROCsh   | 660 MOV R1,x<br>670 MOV R2,y   | 620 STMIA (table)!,(x,y,vx,vy)<br>630 SUBS count,count,#1  |
| 180 IF ERR=17 GOTO 90<br>190 IF ERR=20 VDU 7:GOTO 90   | owxy:done=TRUE  | 680 CMP RØ,#0  | 640 BNE loop   |
| 200 REPORT: PRINT" at line "; ERL<br>210 END   | 1290 UNTIL done<br>1300 ENDPROC   | 690 ADDEQ R1,R1,#1<br>700 CMP R0,#1  | 650 MVN RØ,#0<br>660 STR RØ,[table]  |
| 220 :  | 1310 :  | 710 SUBEQ R1,R1,#1   | 670 MOV pc,link  |
| 230 DEF PROCSetup<br>240 rec=FALSE   | 1320 DEF PROCredraw<br>1330 *FX19   | 720 CMP RØ,#2<br>730 ADDEQ R2,R2,#1  | 680 :<br>690 .bang MOV count,#200  |
| 250 maxpoints=10000  | 1340 PROCrec(ox%-os%,oy%-os%,os%*2,os%*   | 740 CMP RØ,#3  | 700 LDR colour, Colour<br>710 LDR screen, Screen   |
| 260 scale=1024<br>270 PROCc(0)   | 2)<br>1350 rec=FALSE  | 750 SUBEQ R2,R2,#1<br>760 CMP R1,#320  | 720 .repeat ADR table, Table   |
| 280 VDU 19,0,7;0;  | 1360 PROCrec(X%-size%, Y%-size%, size%*2, size%*2)  | 770 BCS pickd<br>780 CMP R2,#256   | 730 .for LDMIA table, {x,y,vx,vy} 740 ADD vy,vy,#1<<5  |
| 290 VDU 19,1,0;0;<br>300 VDU 28,65,31,79,0,12  | 1370 rec=TRUE   | 790 BCS pickd  | 750 ADD x,x,vx   |
| 310 MOVE scale,0:DRAW scale,4000<br>320 VDU 24,0;0;scale-1;scale-1;  | 1380 ox%=X%:oy%=Y%:os%=size%<br>1390 ENDPROC  | 800 ADD addr,write,R2,ASL #6<br>810 ADD addr,addr,R2,ASL #8                              | 760 ADD  |
| 330 IF arc MOUSE RECTANGLE 0,0, scale, s   | 1400 :  | 820 STRB col,[addr,R1]   | 780 MOV R2,y,LSR #13   |
| cale<br>340 PRINT"Henon Curve"   | 1410 DEF PROCrec(a,b,c,d)<br>1420 IF arc RECTANGLE a,b,c,d:ENDPROC  | 830 .next SUBS num,num,#1<br>840 BNE pickx   | 790 ADD off,R2,R2,LSL #2<br>800 ADD off,R1,off,LSL #6  |
| 350 PROCinitxy   | 1430 MOVE a,b:DRAW a+c,b:DRAW a+c,b+d:D   | 850 STR R7, Seed   | 810 CMP R1,#320  |
| 360 A=1.4<br>370 B=0.3   | RAW a,b+d:DRAW a,b<br>1440 ENDPROC  | 860 LDMFD (sp)!, {pc}<br>870 :   | 830 ORR RØ, vx, colour   |
| 380 X=0  | 1450 :  | 880 Seed EQUD TIME<br>890 Xor EQUD &1D872B41   | 840 STRLOB R0,[screen,off]<br>850 MOVHS x,#1<<30   |
| 390 Y=0<br>400 *FX4,1  | 1460 DEF PROCgetpos<br>1470 IF arc MOUSE X%,Y%,Z ELSE Z=0   | 900 .Screen EQUD 148   | 860 STMIA (table)!, (x,y,vx,vy)  |
| 410 ENDPROC  | 1480 IF INKEY-1 step=32 ELSE step=4   | 910 EQUD -1  | 870 .fast LDR x,[table],#16<br>880 CMP x,#1<<30  |
| 420 :<br>430 DEF PROCC(s)  | 1490 IF INKEY-26 AND X%>0 X%=X%-step<br>1500 IF INKEY-122 AND X% <scale x%="X%+st&lt;/td"><td>920 ]NEXT<br/>930 SYS "OS_ReadVduVariables", Screen, S</td><td>890 BEQ fast</td></scale>  | 920 ]NEXT<br>930 SYS "OS_ReadVduVariables", Screen, S                                    | 890 BEQ fast   |
| 440 VDU 23;10,95+s;0;0;0;0;  | ep<br>1510 IF INKEY-42 AND Y%>0 Y%=Y%-step  | creen<br>940 Screen!4=!Screen+320*256  | 900 SUB table, table, #16<br>910 CMN x, #1   |
| 450 ENDPROC<br>460 :   | 1510 IF INKEY-42 AND Y% scale Y%=Y%+ste   | 950 ENDPROC  | 920 BNE for  |
| 470 DEF PROCinitxy<br>480 xmin=-1.5  | p<br>1530 IF (X%<>ox% OR Y%<>oy%) AND arc MO  | 960 :<br>970 DEF FNrnd(n)  | 930 SUBS count,count,#1<br>940 BNE repeat  |
| 490 xmax= 1.5  | USE TO X%, Y%   | 980 [OPT pass  | 950 MOV pc,link<br>960:  |
| 500 ymin=-0.5<br>510 ymax= 0.5   | 1540 Z=Z-(INKEY-103)-2*(INKEY-99)-4*(IN<br>KEY-104)   | 990 MOV RØ, #Ø<br>1000   FOR bit=1 TO n: [OPT pass                                       | 970 .Screen EQUD 148   |
| 520 ENDPROC  | 1550 ENDPROC  | 1010 MOVS R7,R7,LSL #1   | 980 EQUD -1<br>990 .Colour EQUD 0  |
| 530 :<br>540 DEF PROCShowxy  | 1560 :<br>1570 DEF PROCnewlimits  | 1020 EORCS R7,R7,R8<br>1030 ADC R0,R0,R0   | 1000 .Rnd1 EQUD 0  |
| 550 @%=&20509  | 1580 xmin=oxmin+(X%-size%)/xs<br>1590 xmax=oxmin+(X%+size%)/xs  | 1040 ]:NEXT<br>1050 =""  | 1010 .Rnd2 EQUD 0<br>1020 .Xpos EQUD 0   |
| 560 PROCvar(12, "Xmin", xmin)<br>570 PROCvar(14, "Ymin", ymin)   | 1600 ymin=oymin+(Y%-size%)/ys   | 1060 :   | 1030 .Ypos EQUD 0  |
| 580 PROCvar(16, "Size", xmax-xmin)<br>590 @%=&0A   | 1610 ymax=oymin+(Y%+size%)/ys<br>1620 done=TRUE   | 1070 DEF PROCpicture<br>1080 FOR i=1 TO 100  | 1040 .Num EQUD 0<br>1050 .Table  |
| 600 ENDPROC  | 1630 ENDPROC  | 1090 GCOL RND(127) TINT RND(255)   | 1060 ]   |
| 610 :<br>620 DEF PROCvar(vpos,lab\$,var)   | 7 7   | 1100 CIRCLE RND(1280), RND(1024), RND(30<br>0)   | 1070 NEXT<br>1080 SYS "OS_ReadVduVariables", Screen, S   |
| 630 PRINTTAB(0, vpos); lab\$; "=";   | Listing 7   | 1110 NEXT  | creen<br>1090 ENDPROC  |
| 640 IF var>=0 VDU 32<br>650 PRINT; var   | 10 REM >Creepy (Info7)  | 1120 ENDPROC   |  |
| 660 ENDPROC  | 20 REM By Dean Murphy   | Listing 8  | Listing 9  |
| 670 :<br>680 DEF PROCparams  | 30 REM For Archimedes only<br>40 REM (C) BAU November 1991  |  |  |
| 690 PRINTTAB(0,2);   | 50 :<br>60 MODE 13:OFF  | 10 REM >Rockets (Info8)<br>20 REM By Jan Vlietinck                                       | 10 REM >Bubbles (Info9)<br>20 REM By James Wilkinson   |
| 700 PROCc(1)<br>710 A=FNinput("A",A)   | 70 PROCcode   | 30 REM For Archimedes only   | 30 REM For Archimedes only   |
| 720 B=FNinput("B",B)<br>730 X=FNinput("x",X)   | 80 PROCpicture<br>90 disp=1   | 40 REM (C) BAU November 1991<br>50 :   | 40 REM (C) BAU November 1991<br>50 :   |
| 740 Y=FNinput("y",Y)   | 100 REPEAT  | 60 ON ERROR MODEØ:IF ERR<>17 PRINTREP  | 60 ON ERROR MODE 0:IF ERR<>17 PRINTRE  |
| 750 PROCc(0)<br>760 ENDPROC  | 110 A%=250 : REM 1600 with Arm 3<br>120 CALL creep  | ORTS;" at line ";ERL:END ELSE END<br>70 MODE 13:OFF                                      | PORT\$;" at line "; ERL: END ELSE END<br>70 MODE 0:OFF   |
| 770 :  | 130 WAIT  | 80 PROCassemble  | 80 frames=FNframes<br>90 FOR frame=1 TO frames   |
| 780 DEF FNinput(v\$,default) 790 PRINTv\$;": ";:tab=POS  | 140 SYS 6,113,3-disp<br>150 disp=3-disp   | 90 REPEAT<br>100 R=RND(8000)+100   | 100 PROCwrite(frame)   |
| 800 PRINT; default; :end=POS   | 160 SWAP !Screen, Screen!4  | 110 TIME=0<br>120 REPEAT   | 110 CLS<br>120 NEXT  |
| 810 PRINTTAB(tab, VPOS);<br>820 key=GET  | 180 :   | 130 CLS  | 130 MOUSE ON 1   |
| 83Ø IF key=13 PRINT:=default<br>84Ø PRINTSPC(end-tab); TAB(tab, VPOS);   | 190 DEF PROCCODE<br>200 DIM code 4000   | 140 !Num=R/2+RND(R/2)<br>150 !Rnd1=RND   | 140 size=0<br>150 count=0  |
| 850 A%=138:X%=0:Y%=key:CALL &FFF4  | 210 x=2   | 160 !Rnd2=RND  | 160 frame=0  |
| 860 INPUT ""a\$  | 220 y=3<br>230 col=4  | 170 !Xpos=RND(320)<<13<br>180 !Ypos=(RND(200)+20)<<13                                    | 170 type=3<br>180 CLS  |
|  |   | 190 !Colour=RND(254)   | 190 REPEAT   |
| 870 = VAL(a\$)<br>880 :  | 240 num=9   | aga gatt init  |  |
| 870 =VAL(a\$)<br>880 :<br>890 DEF PROCPlot(x,y)  | 240 num=9<br>250 read=10<br>260 write=11  | 200 CALL init<br>210 WAIT  | 200 WAIT<br>210 PROCdisplay((frame+frames-1)MODfra   |
| 870 = YAL(a\$)<br>880 :<br>890 DEF PROCPLOT(x,y)<br>900 PROCENOWNY<br>910 CLG:GCOL 0,1   | 250 read=10<br>260 write=11<br>270 addr=12  | 210 WAIT<br>220 CALL bang  | 210 PROCdisplay((frame+frames-1)MODfra<br>mes+1)   |
| 870 =VAL(a\$) 880 : 890 DEF PROCPLOT(x,y) 900 PROCShowxy 910 CLG:GCOL 0,1 920 xs=scale/(xmax-xmin)   | 250 read=10<br>260 write=11   | 210 WAIT<br>220 CALL bang<br>230 UNTIL TIME>200<br>240 UNTIL 0                           | 210 PROCdisplay((frame+frames-1)MODfra<br>mes+1)<br>220 PROCwrite(frame+1)<br>230 MOUSE mx, my, mz   |
| 870 = VAL(a\$) 880 : 690 DEF PROCPLOt(x,y) 900 PROCSHOWXY 910 CLG:GCOL 0,1 920 xs=scale/(xmax-xmin) 930 ys=scale/(ymax-ymin) 940 xc=s*xmin   | 250 read=10<br>260 write=11<br>270 addr=12<br>280 sp=13<br>290 link=14<br>300 pc=15   | 210 WAIT<br>220 CALL bang<br>230 UNTIL TIME>200<br>240 UNTIL 0<br>250 END                | 210 PROCdisplay((frame+frames-1)MODfra<br>mes+1)<br>220 PROCwrite(frame+1)<br>230 MOUSE mx,my,mr<br>240 If (mz AND) z) size=40   |
| 870 = VAL(a\$) 880: 890 DEF PROCPLOT(x,y) 900 PROCSHOWNY 910 CLGCOL 0.1 920 xs=scale/(xmax-xmin) 930 ys=scale/(ymax-ymin) 940 xc=xs*xmin 950 yc=ys*ymin 950 yc=ys*ymin 950 FOR Thel TO 5 | 250 read=10<br>260 write=11<br>270 addr=12<br>280 sp=13<br>290 link=14<br>303 pc=15<br>310 FOR pass=0 TO 2 STEP 2:P%=code<br>320 [OPT pass  | 210 WAIT 220 CALL bang 230 UNTIL TIME>200 240 UNTIL 0 250 END 260 : 270 DEF PROCassemble | 210 PROCdisplay((frame+frames-1)MODfra<br>mes+1)<br>220 PROCWrite(frame+1)<br>230 MOUSE mx,my,mz<br>240 IF (mz AND 2) size=40<br>250 IF (mz AND 4) THEN<br>260 IF size=0 count=0 |
| 870 =VAL(a\$) 880 DEF PROCPLOT (x,y) 900 PROCSHOWAY 910 CLG:GCOL 0,1 920 xs=scale/(xmax-xmin) 930 ys=scale/(ymax-ymin) 940 xc=xs*xmin 950 yc=ys*ymin                                     | 250 read=10<br>260 write=11<br>270 addr=12<br>280 sp=13<br>290 link=14<br>300 pc=15<br>310 FOR pass=0 TO 2 STEP 2:F%=code   | 210 WAIT 220 CALL bang 230 UNTIL TIME>200 240 UNTIL 0 250 END 260 :                      | 210 PROCdisplay((frame+frames-1)MODfra<br>mes+1)<br>220 PROCwrite(frame+1)<br>230 MOUSE mx,my,mz<br>240 If (mz AND 2) size=40<br>250 IF (mz AND 4) THEN                          |



```
200 ENDIF
290 IF (mz AND 1) THEN
300 IF size=0 count=0
310 size=30-20*COSRAD(count*2)
    320 ENDIF
330 IF mz<>0 THEN
340 PROCbubble(mx,my,size,type)
350 ELSE
      360 size=0
      370 ENDIF
      380 key$=INKEY$0
390 IF key$>"0" AND key$<"6" type=VALk
 ey$
400 frame=(frame+1)MODframes
410 count+=1
420 UNTIL FALSE
     440 DEF PROCdisplay(scrn)
450 SYS"OS_Byte",113,scrn
460 ENDPROC
470:
     480 DEF PROCWrite(scrn)
490 SYS "OS_Byte",112,scrn
500 ENDPROC
510 :
520 DEF PROCDubble(ox,oy,radius,type)
530 CASE type OF
540 WHEN 1:PROCc(0,1) : 1
Em white edge
550 WHEN 2:PROCcf(0,1) : 1
```

```
560 WHEN 3:PROCcf(0,0):PROCc(0,1) : R
560 WHEN 3:PROUCT(0;0) PROCC(0;1) : R
EM black, white edge
570 WHEN 4:PROCC(0;0) : R
EM white, black edge
580 WHEN 5:PROCC(13;0):PROCC(0;1) : R
EM pattern, white edge
590 ENDCASE
680 ENDCASE
680 ENDCASE
      600 ENDPROC
      610
     510 : EP PROCC(a,b)
530 GCOL a,b:CIRCLE ox,oy,radius
640 ENDPROC
550 :
660 DEF PROCC(a,b)
670 GCOL a,b:CIRCLE FILL ox,oy,radius
680 ENDPROC
      700 DEF FNframes
710 SYS "OS_ReadDynamicArea",2 TO ,scr
 eensize
720 =screensize DIV (20*1024)
```

# Listing 10

67Ø c12=e22

```
10 REM >Tree2 (Info10)
20 REM By Paul McKenzie
30 REM For BBC B/B+/M/C/E/A
40 REM (C) BAU November 1991
 60 gxr=FALSE
```

```
80 MODE 1
90 VDU 23;10,32;0;0;0;0;
100 VDU 29,640;0;
110 VDU 19,1,1;0;
120 VDU 19,2,2;0;
130 VDU 19,3,5;0;
  140 steps=7
  150 len=300
 160 type=1:PROCt(0,0,len,90,steps)
170 type=2:PROCt(0,0,len,90,steps)
180 END
 190 :
200 DEF PROCt(x,y,1,a,s)
210 IF s=0 ENDPROC

220 ox=x:x=ox+1*COSRAD(a)

230 oy=y:y=oy+1*SINRAD(a)

240 IF type=1 PROCbranch ELSE PROCleav
250 PROCt(x,y,1*0.6,a+30,s-1)
260 PROCt(x,y,1*0.7,a-60,s-1)
270 PROCt(x,y,1*0.5,a+80,s-1)
280 ENDPROC
280 ENDPRCC
290 :
300 DEF PROCbranch
310 IF gxx GCOL 32,1 ELSE GCOL 0,1
310 w11/10
330 MOVE Cx.oy : MOVE Ox+w*COSRAD(a+90)
```

570 ?(B%+I%)=rule%(index%)

350 NOVE OX. 9; NOVE OX. W\*COSRAD(a+90) 340 PLOT 85,x,y:PLOT 85,x+w\*COSRAD(a+9 0),y+w\*SINRAD(a+90) 350 ENDPROC 360:

370 DEF PROCleaves 380 FOR leaf=1 TO 20 390 IF RND(5)=1 GCOL 0,3 ELSE GCOL 0,2 400 PLOT 69,x+RND(32)-16,y+RND(32)-16

# Listing 11

10 REM >Rope (Infoll)
20 MODEG:OFF:OSCLI"POINTER 1":N=10:L=
700:E=.7:g=.2:D=L/N:DIMY(N), M(N), P(N), Q(N))
N:REPEATMOUSEX, Y, B:MOVEX, Y:FORI=1TON:x=
P(I)-X+V(I)\*E:y=Q(I)-Y+W(I)\*E:d=D/SQR(x\*
x+y\*y+.4):X+xx\*d:P(I)=X:Y+=y\*d:Q(I)=Y:d=
d/2-.5:V(I)+=x\*d:W(I)+=y\*d-g:V(I-1)=x\*d:W(I-1)=y\*d-g:NEXY:MATT:CLS:FORI=1TON:D
RAWP(I),Q(I):NEXT:UNTILO

# Listing 12

10 REM >JDUP (Info12)
20 MODEG:P=10:L=20:DIMC(P),W P,H P:FO
RY=L-170087EP-1:Z=0:B=212\*Y(L:FORL=1700:C(1)=RND(400)+120:W?1=RND(40)+9:H?1=RND(20):NEXT:Z=B:FORX=070639:y=B+2:Z=ABS(Z+(RND(5)=1)):FOR1=170P:0=180\*(x-C(1)+W?1).
(2\*W?1):y=y+H?1\*SINRAD(-0\*(0)=0ANDO<180)):NEXT:GCOL0,0:MOVER\*2,B\*4:DRAW\*2,y\*4:GCL0,1:DRAW(x-1)\*2,z\*4:z=y:NEXT,

# **Pieces of Eight**

# Listing 1

```
10 REM >Pythagoras (Tree of) (Po81)
20 REM By Albert Koelmans
30 REM For BBC B/B+/M/C/E/A
40 REM (C) BAU November 1991
50 REM From February 1987
              NO NOUT X coordinate: "%%
90 INPUT"X coordinate: "Y%
100 INPUT"Initial size: "L%
110 INPUT"Mininum size: "M%
120 INPUT"Start angle: "a
130 INPUT"Alternation: "mod
                  140 CLS
140 CLS
150 a=RAD(a)
160 MOVE X$-15, Y$:DRAW X$-15, 2*15+Y$
170 DRAW X$-15, Y$:18+Y$:DRAW X$+15, Y$
180 DRAW X$-15, Y$
190 FROCTEC(X$-15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 1*15, 2*15+Y$, X$+15, 1*15, 2*15+Y$, X$+15, 1*15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 2*15+Y$, X$+15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*15, 2*
              200 END
                220 DEF FNlength(a,b,c,d)
                250 =SQR(e*e+f*f)
             200 : P ABS(x)>0.01 THEN 320

270 DEF FNangle(x,y)

280 IF ABS(x)>0.01 THEN 320

290 IF ABS(y)<0.01 THEN =0

300 IF y<0 THEN =1.5*PI

310 =PI/2
              320 IF x<0 THEN =(ATN(y/x)+PI) ELSE =A
              340 DEF PROCtree(c11,c12,c21,c22,c31,c
                ,m%)
350 LOCAL v11,v12,v21,v22,e21,e22,e31,
e32,e51,e52,e61,e62,b,c,d,a2
360 IF FNlength(c11,c12,c21,c22)<=M% E
           DPROC

370 v11=c32-c22

380 v12=c21-c31

390 v21=c12-c32

400 v22=c31-c11

410 e21=c31+v11
              420 e22=c32+v12
             430 e31=c21+v11

440 e32=c22+v12

450 e51=c31+v21

460 e52=c32+v22

470 e61=c11+v21

480 e62=c12+v22
```

```
5/0 C1=e2/

680 C21=e31

690 C22=e32

700 V11=c21-c11

710 V12=c22-c12

720 b=PNangle(v11,v12):c=a2-b

730 d=SIN(a2)*SQR(v11*v11+v12*v12)

740 v21=d*SIN(c)
                           756 v22=d*COS(c)
760 c31=c11+v21
770 c32=c12+v22
780 PROCtree(c11,c12,c21,c22,c31,c32,m
%+1)
790 ENDPROC
     Listing 2
                                   10 REM >1DLife (Po82)
20 REM By Susan Stepney
30 REM For BBC B/B+/M/C/E/A
40 REM (C) BAU November 1991
                                   50 REM From November 1988
                                   60 :
70 ON ERROR MODE 7:PROCerror
                     70 ON ERROR MODE 7:PR
80 MODE 7
90 PROCparams
100 PROCsetup
110 MODE mode%
120 VDU 23.1,0;0;0;0;
                           130 PROCecreen
                        140 WAIT=GET
150 END
160 :
                           160 :
170 DEF PROCSETUP
                   170 DEF PROCectup
180 arcs(HIMEMS410000)
190 mode%=2
200 M%=160*2^(2-(mode% MOD 3))
210 IF arc mode%=12:M%=640
220 line%=256
230 xrcs%=1280/M$
240 yrcs%=1024/line%
250 DIM c1% M%
250 DIM c2% M%
                        270 IF rnd PROCinitrnd ELSE PROCinitse
ed
280 ENDPROC
290 :
300 DEF PROCScreen
                        310 LOCAL A%, B%, X%, Y% 320 Y%=1023
  330 FOR J%=070 line%-1
330 FOR J%=0 TO line%-1
340 IF J% MOD 2=0 THEN A%=c1%:B%=c2% E
LSE A%=c2%:B%=c1%
350 FOR I%=0 TO N%-1
                356 FCR 1%=0 TO N%=1
366 GCCD 0,2 (1%*xres%, Y%
370 PLOT 69,1%*xres%,Y%
380 GCCD 0,7 (1%*+M%-1-1%)
380 PLOT 69, (1%*-1-1%)
400 index%=2 (1.4%*-1.4%*-1.4%*)
410 index%=2 (1.4%*-1.4%*-1.4%*-1.4%*)
410 index%=3 (1.4%*-1.4%*-1.4%*-1.4%*-1.4%*)
430 index%=index%*-2 (1.4%*-1.4%*-1.4%*-1.4%*-1.4%*)
430 index%=index%*-2 (1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4%*-1.4
                     440 index2%=index2%+?(A%+ (M%-1-I%+K%)
                DD M%)
450 NEXT
450 P(B%+T%) = rule%(index%)
470 ?(B%+M%-1+T%) = rule%(index2%)
480 NEXT I%
490 X%+N%*Xres%
500 FOR T%+N% TO M%-1-N%
510 GCOL 0.?(A%+T%)
510 FOR T%-N% TO M%-150 FOR T%-N%
510 FOR T%-N%-17%-170 FOR T%-N%-170 FOR T
```

550 index%=index%+?(A%+I%+K%)

```
570 ?(B%+I%)=ru
580 X%=X%+xres%
590 NEXT I%
600 Y%=Y%-yres%
610 NEXT J%
620 ENDPROC
       640 DEF PROCERTOR
       650 VDU 23,1,1;0;0;0;
660 REPORT:PRINT " on line ";ERL
670 END
680 ENDPROC
       700 DEF PROCparams
       710 INPUT "neighbourhood
720 INPUT "states
730 dim%=(S%-1)*(2*N%+1)+1
740 INPUT "rule
e$
750 IF LEN(rule$) < dim% rule$=STRING$ (d
 im%-LEN(rule$), "0")+rule$
760 DIM rule%(dim%)
770 FOR I%=0 TO dim%-1
780 rule%(I%)=EVAL(MID$(rule$,dim%-I%,
790 IF rule%(I%)>=S% VDU7:PRINT"invali
d state ";rule%(I%);" in rule ";rule$:EN
B00 NEXT I%
810 PRINT "seed pattern"'" RETURN for
random,"" or tring of numbers in ran
ge 0-";5%-1;" : "'.IPPU"*seed$
820 IF seed$="" THEN rnd=TRUE ELSE rnd
   = FALSE
      83Ø ENDPROC
      840 :
850 DEF PROCINITYND
860 FOR I%=0 TO M%
870 ?(c1%+1%)=RND(S%)-1
      880 NEXT
  890 ENDPROC
900 :
910 DEF PROCINITSEEd
920 FOR I%=0 TO M%
930 ?(cl%+1%)=0
940 NEXT
950 len%=LEN(seed$)
9560 12%=len%/2
970 start%=N%/2-12%
980 end%=N%/2+12%
980 IF len% MOD 2=0 THEN end%=end%-1
1000 FOR I%=start% TO end%
1010 ?(cl%+1%)=EVAL(MID$(seed$, I%-start %+1,1))
      890 ENDPROC
1020 IF ?(c1%+I%)>=S% VDU7:PRINT"invali
d state ";?(c1%+I%);" in seed pattern ";
d state ";?(c:
seed$:END
1030 NEXT
1040 ENDPROC
```

```
Listing 3
      10 REM >CWD1 - Crossword part 1 (Po83
      20 REM By Joe Telford
30 REM For BBC B+/M/C/A/B with Shad
40 REM (C) BAU November 1991
50 REM From November 1988
    70 M%=20
80 MODE 4
90 VDU 23,8202;0;0;0;
100 PROCSetup
110 PROCtitle
120 CHAIN "CWD2"
130:
```

```
140 DEF PROCSetup
150 VDU 19,0,7;0;
160 VDU 19,0,7;0;
160 VDU 19,1,0;0;
170 VDU 23,128,32,80,80,80,32,0,0,0
180 VDU 23,129,32,80,80,32,112,0,0,0
190 VDU 23,131,95,16,96,16,96,0,0,0
210 VDU 23,131,95,16,96,16,96,0,0,0
210 VDU 23,132,80,80,112,16,16,0,0,0
220 VDU 23,133,112,44,96,16,96,0,0,0
230 VDU 23,134,32,64,96,16,92,0,0,0
230 VDU 23,134,32,64,96,16,32,0,0,0
240 VDU 23,135,121,16,16,32,32,0,0,0
250 VDU 23,137,32,80,48,16,32,0,0,0
         270 VDU 23,153,24,28,246,131,246,28,24
         280 VDU 23,154,24,56,111,193,111,56,24
        299 VDU 23,155,0,0,0,0,0,0,255
300 VDU 23,155,0,0,0,0,0,0,255
310 VDU 23,157,1,1,1,1,1,1,255
320 VDU 23,158,255,255,255,255,255,255
155,255
330 VDU 23,159,255,129,129,129,129,129
         340 ENDPROC
        340 EMPROC

350 :

360 DEF PROCLITIE

370 FOR I=1 TO 20

380 PRINTTAB(1,1); STRING$(20,CHR$159)

390 NEXT

400 FOR I=1 TO 8
        410 READ x,y,a$,d
420 VDU 31,x,y
430 FOR J=1 TO LEN(a$)
440 PRINTMID$(a$,J,1);
450 IF d VDU 8,10
460 NEXT
         470 NEXT
         480 PROCmess ("The Acorn User Crossword
480 FROCEMESS("THE ACOTH USER CROSSWORD
PROGRAM",2,2)
490 PROCEMESS(" Another one of Joe's Jo
things! ",2,25)
500 PROCSDC
510 CLS
520 ENDPROC
       530 :

540 DEFFROCapc

550 PROCmess("Press", 30,1)

560 PROCmess("SPACE", 30,4):PROCmess("t', 7,30,7)

570 PROCmess("go on.", 30,10)

580 REPEAT:SOUND 1,1,4,20:UNTIL INKEY(
300]=32

590 LOCALloop

600 FOR loop=1TO 30:PRINTTAB(30,loop);

STRINGS(10,"");:NEXT

610 ENDPROC

620:

630 DEF PROCdrawwindow(x,y,w,m%,f)
       538 DEF PROCEASMANDOW(X,Y,M,M,*);
640 1=(x+1)*32:d=91-(y+n*+1)*32
650 r=(x+w+1)*32:u=1023-(y+1)*32
650 VDU18,0,131,24,1rd-12;r+12;u;16
670 VDU18,0,131,24,1-8;d-4;r+4;u+8;16
680 VDU18,0,128,24,1-4;d;r;u+4;16,26
690 ENDPROC
720 .
        720 PROCdrawwindow(x,y,LEN(t$)+1,0,1)
730 COLOUR128:COLOUR 7
740 PRINTTAB(x+1,y+1);t$;
      750 ENDEROC
760 :
770 DATA 5,6,ACORNUSER,0
780 DATA 12,12,PROGRAM,0
790 DATA 15,6,JOES,0
800 DATA 3,11,ONE,0
810 DATA 5,8,OF,0
```

650 PROCtree(c11,c12,c21,c22,c31,c32,m

| 820 DATA 13,5,CROSSWORD,1  | 910 PROCmwind(1,0)   | 1940 PROCoscli("SPOOL "+f\$)   | 2970 :   |
|--|--|--|--|
| 830 DATA 5,6,ANOTHER,1<br>840 DATA 15,6,JOTTINGS,1                     | 920 sf=FALSE<br>930 ENDPROC  | 1950 FOR loop=1 TO words<br>1960 PRINTC\$(loop)                                | 2980 DEF PROCsortnos(start,end,t\$) 2990 PROCinf("Number", "sort "+t\$,"")   |
| 640 DATA 15,0,00111R65,1   | 940 :  | 1970 NEXT  | 3000 LOCALinloop, outloop, pointer   |
| Listing 4  | 950 DEF FNdosub<br>960 RESTORE 7730  | 1980 *SPOOL<br>1990 PROCcls:VDU 26   | 3010 FOR outloop= start TO end-1<br>3020 pointer=outloop   |
|  | 970 FOR 1%=0 TO ch*7+sub   | 2000 =0  | 3030 FOR inloop=outloop+1 TO end   |
| 10 REM >CWD2 - Crossword part 2 (Po84                                  | 980 READ m\$<br>990 NEXT   | 2010 :<br>2020 DEF FNCload   | 3040 IF cl(inloop,3) <cl(pointer,3) poin<br="">ter=inloop</cl(pointer,3)>  |
| 20 REM By Joe Telfod   | 1000 =EVAL("FN"+m\$)   | 2030 IF cwd=0 PROCem(bem\$):PROCcls:=0   | 3050 NEXTinloop  |
| 30 REM For BBC B+/M/C/A/B with Shad                                    | 1010 :   | 2040 f\$=FNlname("Load clues","C")<br>2050 IF f\$="" PROCcls:=0                | 3060 IF pointer<>outloop PROCswitch(pointer,outloop)   |
| 40 REM (C) BAU November 1991<br>50 REM Will not work without Shadow    | 1020 DEF PROCmwind(m,f)<br>1030 RESTORE (7640+m*20)  | 2060 =FNcenter(f\$)  | 3070 NEXToutloop   |
| 60 :   | 1040 READ t\$,mx,my,mn,mw  | 2070 :   | 3080 ENDPROC<br>3090 :   |
| 70 MODE 132<br>80 PROCsetup  | 1050 IF m%(m)<>f PROCwind(mx,my,mw,mn,f  | 2080 DEF FNlistc(v)<br>2090 IF clues=0 PROCem("Please enter cl                 | 3100 DEF PROCswitch(a,b)   |
| 90 ON ERROR PROCETT  | 1060 m%(m)=f   | ues first"):=0   | 3110 LOCALspare\$, spare, loop   |
| 100 REPEAT<br>110 REPEAT   | 1070 ENDPROC<br>1080 :   | 2100 PROCwind(1,15,37,15,1)<br>2110 VDU 28,1,30,38,15                          | 3120 spare\$=w\$(a):w\$(a)=w\$(b):w\$(b)=spa<br>re\$   |
| 120 IF NOT sf ch=FNmenu(0,ch)  | 1090 DEF FNwenter(f\$)   | 2120 df=0:VDU 12,v:IF v=3 VDU 14   | 3130 FOR loop=0 TO 3   |
| 130 IF ch<>3 PROCsub(ch)   | 1100 PROCwind(1,11,23,19,1)<br>1110 PROCwind(26,11,11,2,1)   | 2130 PRINT'"CLUES"'"Across:" 2140 FOR loop=1 TO clues                          | 3140 spare=cl(a,loop):cl(a,loop)=cl(b,l<br>oop):cl(b,loop)=spare   |
| 140 UNTIL ch=3<br>150 UNTIL FNok                                       | 1120 PROCinf("Enter words.", "To exit,",   | 2150 IF df=0 AND cl(loop, 2)=0 PRINT'"Do                                       | 3150 NEXT  |
| 160 MODE 7   | "type a *.")   | wn:":df=1<br>2160 PRINTcl(loop,3);" : ";c\$(loop)                              | 3160 ENDPROC<br>3170 :   |
| 170 *FX4<br>180 END  | 1130 VDU 28,1,30,24,11<br>1140 words=0   | 2170 NEXT: VDU3, 26, 15  | 3180 DEF PROCcheckstart(x,y)   |
| 190 :  | 1150 err\$="W"   | 2180 PROCapc   | 3190 LOCAL loop, flag  |
| 200 DEF PROCERT<br>210 VDU3,26:CLOSE#0:COLOUR 128:COLOUR1              | 1160 IF f\$<>"" PROCoscli("EXEC "+f\$)<br>1170 FOR word=1 TO M%  | 2190 =0<br>2200 :  | 3200 FOR loop=1 TO words<br>3210 IF cl(loop,0)=x AND cl(loop,1)=y c  |
| :PROCcurs (Ø)  | 1180 REPEAT  | 2210 DEF FMbuild   | 1(loop, 3) =n:flag=1   |
| 220 PROCcls:m%(2)=0:m%(3)=0 230 IF err\$="W" words=0:clues=0:cwd=0:    | 1190 IF word<10:PRINTTAB(0,word-1);""; word;":";:ELSE:PRINTTAB(0,word-1);word;"  | 2220 IF words=0 PROCem("No words to fit "):=0                                  | 3220 NEXT<br>3230 IF flag=1 n=n+1  |
| PROCresetcw:err\$=""   | i"; of the control of | 2230 cwdtype=FNmenu(2,0)+1   | 3240 ENDPROC   |
| 240 IF err\$="B" cwd=0:PROCresetcw:err\$                               | 1200 w\$(word)=FNgpi(20,0,nos\$+cap\$+"*")   | 2240 COLOUR128:COLOUR1 2250 IF cwdtyne=3 PROCowind(2.0):=0                     | 3250 :<br>3260 DEF PROCSORT  |
| 250 IF err\$="C" clues=0:err\$=""                                      | 1210 UNTIL w\$(word)>" " 1220 IF LEFT\$(w\$(word),1)="*" words=wor   | 2250 IF cwdtype=3 PROCmwind(2,0):=0<br>2260 PROCwind(1,11,21,19,1)             | 3270 LOCALX, y   |
| 260 IF ERR=17 AND NOTINKEY-1 PROCem("L                                 | d-1:word=M%:IF words=0 words=-1  | 2270 PROCwind(26,11,11,2,1)  | 3280 FOR x=1 TO words:FOR y=1 TO words-  |
| ast action cancelled"):ENDPROC 270 IF ERR=198 PROCem("Disc Full: Chan  | 1230 NEXT word<br>1240 IF words=0 words=M%   | 2280 FOR I%=0 TO 19<br>2290 PRINTTAB(2,1%+11); STRING\$(20,CHR\$1              | 1 3290 IF LENW\$(y) < LENW\$(y+1) PROCSWap(y,  |
| ge Disc"):ENDPROC  | 1250 IF words=-1 words=0   | 59)  | y+1)   |
| 280 IF ERR=190 PROCem("Catalogue Full:                                 | 1260 cwd=0:err\$="":VDU26<br>1270 PROCresetcw  | 2300 NEXT 2310 PROCinf("Blanking", "grid.", "")                                | 3300 NEXT:NEXT<br>3310 ENDPROC   |
| Change Disc"):ENDPROC<br>290 IF ERR=179 PROCem("Directory Full:        | 1280 PROCcls   | 2320 cwd=0:PROCresetcw   | 3320 :   |
| Change Disc"):ENDPROC  | 1290 PROCwind(1,11,37,19,0)  | 2330 PROCinf("Sorting", "words.", "") 2340 err\$="W":PROCsort:err\$=""         | 333Ø DEF PROCSWAP(a,b):LOCAL A\$<br>334Ø A\$=w\$(a):w\$(a)=w\$(b):w\$(b)=A\$   |
| 300 REPORT: PRINT" at line ";ERL:*FX4 310 END                          | 1300 =0<br>1310 :  | 2350 PROCinf("Fitting", "words.","")   | 3350 ENDPROC   |
| 320 :  | 1320 DEF FNwsave   | 2360 err\$="B":PROCfit:err\$=""  | 3360 :   |
| 330 DEF PROCEETUP<br>340 DIM cw%(M%,M%),cl(M%,3),a\$(11),w\$(          | 1330 IF words=0 PROCem("No words to sav<br>e"):=0  | 2370 IF cwd<>2 cwd=1<br>2380 IF cwd=1 PROCnumbersquares                        | 3370 DEF FNxchange(x)<br>3380 LOCALbubbleup  |
| M%),c\$(M%),i\$(2),m%(3)   | 1340 f\$=FNsname("words","W")  | 2390 PROCspc:PROCmwind(2,0)  | 3390 IF words=x THEN =TRUE   |
| 350 DIM osb 13,blk 40  | 1350 IF f\$="" PROCcls:=0<br>1360 PROCwind(1,25,37,3,1)  | 2400 =0<br>2410 :  | 3400 wspare\$=w\$(x)<br>3410 FOR bubbleup=x TO words-1   |
| 360 err\$="":words=0:clues=0:cwd=0:M%=2<br>0:ch=0:*FX4,1               | 1370 VDU 28,1,28,38,25   | 2420 DEF PROCEIT   | 3420 w\$(bubbleup)=w\$(bubbleup+1)   |
| 370 bem\$="Please build/load crossword                                 | 1380 PROCoscli("SPOOL "+f\$)   | 2430 x=0:REPEAT:x=x+1<br>2440 PROCfitword(x):VDU 26                            | 3430 NEXT<br>3440 w\$(words)=wspare\$  |
| first" 380 sf=FALSE  | 1390 FOR loop=1 TO words<br>1400 PRINT w\$(loop)   | 2450 UNTIL x>=words  | 3450 =FALSE  |
| 390 VDU 23;8202;0;0;0;0;   | 1410 NEXT  | 2460 ENDPROC   | 3460 :<br>3470 DEF PNloselast  |
| 400 VDU 19,0,7;0;19,1,0;0;<br>410 PROCvalid:PROCresetcw                | 1420 *SPOOL<br>1430 PROCcls:VDU26  | 2470 :<br>2480 DEF PROCfitword(x)  | 3480 LOCALA\$  |
| 420 ENVELOPE 1,0,0,0,0,0,0,126,-2,-1                                   | 1440 =0  | 2490 PRINTTAB(26,11); "Fitting"  | 3490 PROCmess(w\$(words)+" won't fit.",2   |
| ,-1,126,100<br>430 PROCcurs(0)   | 1450 :<br>1460 DEF FNwload   | 2500 PRINTTAB(26,12); "word ";x<br>2510 PRINTTAB(26,13); "from ";words         | 3)<br>3500 PROCmess("(L)ose or (K)eep it?",26  |
| 440 ENDPROC  | 1470 f\$=FNlname("Load words", "W")  | 2520 VDU 28,2,30,23,11   | 1  |
| 450 :  | 1480 IF f\$="" PROCcls:=0<br>1490 =FNwenter(f\$)   | 2530 IF x=1 PROCfitword1:ENDPROC<br>2540 fitdone=FALSE:state=FALSE             | 3510 REPEAT:A\$=CHR\$(GET AND 223):UNTIL<br>A\$="L" OR A\$="K"   |
| 460 DEF PROCVALID 470 cap\$=" ABCDEFGHIJKLMNOPQRSTUVWXYZ"              | 1500 :   | 2550 REPEAT  | 3520 PRINTA\$  |
| 480 low\$=" abcdefghijklmnopqrstuvwxyz"                                | 1510 DEF FNlista(v)  | 2560 IF cwdtype=1 fitdone=FNclosedloop<br>2570 IF cwdtype=2 fitdone=FNopenloop | 3530 IF A\$="K" PROCmess("Word kept - Re<br>build crossword",29):PROCresetcw:=2  |
| 490 nos\$=".0123456789"<br>500 pun\$="!#\$%&'()=?/*:+;.,<>"+CHR\$      | 1520 IF cwd=0 PROCem(bem\$):=0<br>1530 PROCwind(1,15,37,15,1)  | 2580 IF NOT fitdone state=FNxchange(x)   | 3540 w\$(words)="":words=words-1   |
| 34   | 1540 VDU 28,1,30,38,15   | 2590 UNTIL state OR fitdone  | 3550 PROCmess ("Word deleted - crossword OK", 29)  |
| 510 all\$=nos\$+cap\$+low\$+pun\$<br>520 ENDPROC                       | 1550 df=0:VDU 12,v:IF v=3 VDU 14<br>1560 PRINT'"ANSWERS"'"Across:"   | 2600 IF FNprint(3)<br>2610 IF state AND NOT fitdone AND x=wor                  | 3560 =TRUE   |
| 530 :  | 1570 FOR loop=1 TO words   | ds cwd=FNloselast  | 3570 :   |
| 540 DEF FNok<br>550 PROCmess("Do you really want to ex                 | 1580 IF df=0 AND cl(loop,2)=0 PRINT'"Do<br>wn:":df=1   | 262Ø ENDPROC<br>263Ø :   | 3580 DEF PROCfith1<br>3590 py=INT(M%/2):px=py-INT(LENw\$(1)/2)   |
| it? (Y/N) ",20)  | 1590 PRINTcl(loop, 3);" : "; w\$(loop)   | 2640 DEF PROCfitword1  | :cl(1,0)=px:cl(1,1)=py:cl(1,2)=dir   |
| 560 REPEAT A\$=CHR\$(GET AND 223):UNTIL<br>A\$="Y" OR A\$="N"          | 1600 NEXT:VDU3,26,15<br>1610 PROCspc   | 2650 dir=RND(2)-1<br>2660 IF dir=1 PROCfith1 ELSE PROCfitv1                    | 3600 PROCplace(1, w\$(1))<br>3610 ENDPROC  |
| 570 PRINTA\$   | 1620 =0  | 2670 IF FNprint(3)   | 3620 :   |
| 580 PROCwind(2,20,36,0,0)<br>590 = (A\$="Y")                           | 1630 :<br>1640 DEF FNcenter(f\$)   | 268Ø ENDPROC<br>269Ø :   | 3630 DEF PROCfitv1<br>3640 px=INT(M%/2):py=px-INT(LENW\$(1)/2)   |
| 600 :  | 1650 IF cwd=0 PROCem(bem\$):PROCcls:=0   | 2700 DEF PROCnumbersquares   | :cl(1,0)=px:cl(1,1)=py:cl(1,2)=dir   |
| 610 DEF PROCeurs (8%)  | 1660 PROCwind(6,12,26,0,1)<br>1670 PRINTTAB(6,12); "Please enter all t   | 2710 PROCinf("Numbering", "Squares", "") 2720 LOCAL x,y,n:n=1                  | 3650 PROCplace(1,w\$(1))<br>3660 ENDPROC   |
| 620 VDU 23;10,255-8%*152;0;0;0<br>630 ENDPROC                          | he clues."   | 2730 FOR y=1 TO M%:FOR x=1 TO M%   | 3670 :   |
| 640 :  | 1680 PROCwind(4,17,30,2,1)<br>1690 err\$="C"   | 2740 IF cw%(x,y)<>0 PROCcheckstart(x,y)<br>2750 NEXT:NEXT                      | 3680 DEF PROCplace(w,t\$)<br>3690 VDU 31,px,py   |
| 650 DEF FNmenu(m,c)<br>660 PROCmwind(m,1)                              | 1700 clues=0   | 2760 PROCsortad  | 3700 IF cl(w,2)=0 PROCplacev(w,t\$)  |
| 670 COLOUR 1:COLOUR 128  | 1710 IF f\$<>"" PROCoscli("EXEC "+f\$)   | 2770 startdown=PNfinddown<br>2780 PROCsortnos(1,startdown-1,"across"           | 3710 IF cl(w,2)=1 PROCplaceh(w,t\$)<br>3720 ENDPROC  |
| 680 PRINTTAB(mx,my);t\$ 690 REPEAT                                     | 1720 FOR clue=1 TO words<br>1730 wrd\$=STR\$(cl(clue,3))   | )  | 3730 :   |
| 700 RESTORE (7650+m*20)  | 1740 IF cl(clue, 3) < 10 wrd\$=" "+wrd\$   | 2790 PROCsortnos(startdown,words,"down"  | 3740 DEF PROCPLACEV(w,t\$)<br>3750 FOR y=cl(w,1) TO cl(w,1)+LENt\$-1   |
| 710 FOR I=0 TO mn-1<br>720 READ a\$:IF a\$="<" a\$=CHR\$154            | 1750 IF cl(clue,2)=0 wrd\$=wrd\$+" DOWN " ELSE wrd\$=wrd\$+" ACROSS "  | 2800 ENDPROC   | 3760 cw%(cl(w,0),y)=ASCMID\$(t\$,1+y-cl(w  |
| 730 COLOUR 1+(I=c):COLOUR 128-(I=c)                                    | 1760 wrd\$=wrd\$+"is: "  | 2810 :   | ,1),1)<br>3770 NEXT:ENDPROC  |
| 740 PRINTTAB(mx,my+I+1);a\$;<br>750 IF m=0 AND I<3 OR m=1 AND ch=2 AND | 1770 PROCmess (wrd\$+w\$(clue)+STRING\$(21-<br>LENw\$(clue),""),15)  | 2820 DEF FNfinddown<br>2830 LOCALn:n=0:REPEAT:n=n+1:UNTIL cl(n                 | 3780 :   |
| (I=Ø OR I=4) PRINTSPC(mw-LENa\$); CHR\$153                             | 1780 VDU28,5,20,34,18  | ,2)=0  | 3790 DEF PROCplaceh(w,t\$)   |
| 760 NEXT<br>770 REPEAT   | 1790 REPEATVDU30<br>1800 c\$(clue)=FNgpi(60,0,all\$)   | 2840 =n<br>2850 :  | 3800 FOR x=c1(w,0) TO c1(w,0)+LENt\$-1<br>3810 cw%(x,c1(w,1))=ASCMID\$(t\$,1+x-c1(w  |
| 78Ø A=INSTR(CHR\$138+CHR\$139+CHR\$13,GET                              | 1810 UNTIL c\$(clue)>""  | 2860 DEF PROCSortad  | ,0),1)   |
| \$)  | 1820 VDU26<br>1830 NEXT clue   | 2870 PROCinf("Sorting", "across &", "down ")                                   | 382Ø NEXT:ENDPROC<br>383Ø :  |
| 790 IF A=1 c=(c+1)MODmn<br>800 IF A=2 c=(c+mn-1)MODmn                  | 1840 err\$="":clues=words  | 2880 LOCALinloop, outloop, pointer   | 3840 DEF PROCresetcw   |
| 810 UNTIL A  | 1850 PROCcls<br>1860 =0  | 2890 FOR outloop=1 TO words-1<br>2900 pointer=outloop                          | 3850 FOR y=1 TO M%:FOR x=1 TO M%:cw%(y,<br>x)=0:NEXT:NEXT  |
| 820 UNTIL A=3<br>830 =c  | 1860 =0<br>1870 :  | 2910 FOR inloop=outloop+1 TO words   | 386Ø ENDPROC   |
| 840 :  | 1880 DEF FNcsave   | 2920 IF cl(inloop,2)>cl(pointer,2) poin  | 3870 :<br>3880 DEF PNclosedloop  |
| 850 DEF PROCsub(ch)<br>860 IF NOT sf sub=0:sf=TRUE                     | 1890 IF words=0 OR cwd=0 PROCem("No clu<br>es to save"):=0   | ter=inloop<br>2930 NEXTinloop  | 389Ø LOCALloop   |
| 87Ø REPEAT   | 1900 f\$=FNsname("clues", "C")   | 2940 IF pointer<>outloop PROCswitch(poi  | 3900 FOR loop=1 TO x-1<br>3910 fitdone=FNfit(w\$(x),loop,cl(loop,2   |
| 880 sub=FNmenu(1,sub):ex=(sub=7)<br>890 IF NOT(ex) ex=FNdosub          | 1910 IF f\$="" PROCcls:=0<br>1920 PROCwind(1,25,37,3,1)  | nter,outloop) 2950 NEXToutloop   | III in the second of the secon |
| 900 UNTIL ex<0   | 1930 VDU 28,1,28,38,25   | 2960 ENDPROC   | 3920 IF fitdone loop=x-1   |

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```
rty)=ASCHID$(w$,wloop,1) THEN dumfit=FNt
ryfitv(cloop,starty,wloop,w$)
4866 IF dumfit wloop=LENw$
4870 NEXTWloop
4888 IF dumfit cloop=startx+ltf
  3930 NEXT
3940 =fitdone
3950 :
3960 DEF FNopenloop
                                                                                                                                                                                                                                                                                                                                                                           5800 IF cwd=0 PROCem(bem$):=0
5810 PROCwind(1,11,21,19,1)
5820 VDU 28,2,30,23,11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6800 :
6810 DEF FNsname(t$,p$)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0010 URF FMSHAME(E(5,p5)
6820 PROCVAM(21,1,LEM(E5)+8,2,1)
6830 PRINTTAB(21,1), "Save ";t$;" as ";
6840 REFEAT: PRINTTAB(23,3), p5;".";
6850 f$=p5;"."+f5;ah=OFENUPf5;cLOSE#ah
6870 IF ah<>0 PROCEM("That name is in u
                                                                                                                                                                                                                                                                                                                                                                            5830 IFFNprint(v)
5840 IF v=3 VDU 26:PROCspc
      3978 LOCALIOOD
3988 FORLOOPEX-1 TO 1 STEP -1
3990 fitdone=FNfit(w$(x),loop,cl(loop,2
                                                                                                                                                                                                                                                                                                                                                                         5840 IF y=3 VDU 26:PROCEPC
5850 =0
5850 =0
5860 :
5870 DEF FNprint(v)
5880 LOCAL x,y
5980 FOR y=1 Y0 M*:IF y=2 VDU 1,14
5990 FOR y=1 Y0 M*:IF y=2 VDU 1,14
5910 FOR x=1 TO M*
5920 IF y=3 AND cw*(x,y)=0 VDU 159
5930 IF y=2 AND cw*(x,y)=0 VDU 42
5940 IF cw*(x,y)=0 VDU 42
5940 IF cw*(x,y)=0 VDU cw*(x,y);
5950 NEXT:IF y<>M* FRINT
5960 NEXT:IF y<>M* PRINT
5960 NEXT:VDU 3
5970 =0
                                                                                                                                                                                          4890 NEXTCloop
4900 =dumfit
                                                                                                                                                                                       4910 :
4920 DEF FMfitvrightleft(w$,pos)
4930 ltf=LERm$(pos)
4940 startx=cl(pos,0)+ltf
4950 startx=cl(pos,0)+ltf
4950 startx=cl(pos,1)
4960 LOCALCloop,wloop,dumfit
4970 dumfit=FALSE
4980 FOR cloop=startx TO startx-ltf STE
P-1
       4000 IF fitdone loop=1
4010 NEXT
4020 =fitdone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               688Ø =f$
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6890 :
6900 DEF FNIname(t$,p$)
6910 IFFRicat(p$,0)=0 FROCem("No files to load"):=""
6920 FROCWind(21,1,LEN(t$)+3,2,1)
6930 FRINTTAB(21,1);t$;
6940 REPEAT: PRINTTAB(23,3);p$;".";
6950 t$=px+"."+t$:ak=OPENUPE$:CLOSE#ak
6970 IF ak=0 PROCem("Can't find that file"):=""
      4030 :
4040 DEF FNfit(w$,pos,dir)
4050 IF dir=0 THEN =PNfith(w$,pos)
4060 IF dir=1 THEN =FNfitv(w$,pos)
4070 =PALSE
4080 :
4090 DEF FNfith(w$,pos)
                                                                                                                                                                                    4998 FOR CLOOP=STATEX TO STATEX-IET STE

P -1

4998 FOR WLOOP=1 TO LENN$

5908 IF CLOOP=SNX THEN IF cw%(cloop,sta

rty)=ASCMID$(w$,wloop,w$)

5016 IF dumfit wloop=LENN$

5018 IF Aumfit wloop=LENN$

5028 NEXTWLOOP

5038 IF Aumfit cloop=stateX-ltf

5048 NEXTCLOOP

5059 alumfit
                                                                                                                                                                                                                                                                                                                                                                           5970 =0
                                                                                                                                                                                                                                                                                                                                                                         5978 =0
5998 DEF FNpmenu
5998 DEF FNpmenu
6000 IF cwd=0 FROCem(bem$):=0
6010 po=FNmenu(3,0)
6020 IF po=0 po=FNdword(2)
6030 IF po=1 FNOCpwd("S")
6040 IF po=1 FNOCpwd("L")
6050 PROCc1s:VDU26:FROCmwind(3,0)
6050 =0
6070 :
6080 DEF FROCpwd(t$)
       4100 dumdir=RND(2)
4110 IF dumdir=1 THEN =FNfithdown(w$,po
       4120 IF dumdir=2 THEN =FNfithup(w$,pos)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6980 VDU 28,0,31,39,14,12
6990 =f$
       4130 =FALSE
4140 :
4150 DEF FNfithdown(w$,pos)
 4150 DEF YNfithdown(w$,pos)
4168 startx=cl(pos,8)
4178 startx=cl(pos,1)
4188 ltf=LENN*(pos)
4198 LOCALCHOP, wloop,dumfit
4208 dumfit=FALSE
4218 FOR cloop=starty TO starty+ltf
4228 FOR wloop=1 TO LENN$
4238 IF cloop=sN* THEN IF cw*(startx,cloop)=ASCHINS(s*,wloop,1) dumfit=FNtryfit
h(startx,cloop,wloop,w$)
4248 IF dumfit wloop=LENN$
4258 HEETVHoop
4260 IF dumfit cloop=starty+ltf
4278 NEETVHoop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7610 DEF PROCWIND(x,y,w,n%,f)
7610 DEF PROCWIND(x,y,w,n%,f)
7620 1=x*32:d=991-(y+n%)*32
7630 r=(x+w+1)*32:u=1623-y*32
7640 VDU18,0,128,24,1-12;d-16;r+16;u+12
                                                                                                                                                                                         5050 =dumfit
                                                                                                                                                                                         5060 :
                                                                                                                                                                                      5800 DEF FNtryfitv(cx,cy,w1,w$)
5880 LOCAL loop,realfit
5890 realfiturALSE
5180 FOR LOOPE1 TO LENN$
5110 realfit=FNfvp(loop,w$,cx,cy-w1+loo
                                                                                                                                                                                                                                                                                                                                                                           6080 DEF PROCPCWd(t$)
6090 VDU 28,0,31,39,11,29,0;0;2,1,27,1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7050 IF f=0 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7060 VDU18,0,131,24,1;d-12,r+12;u;16
7070 VDU18,0,131,24,1-8;d-4;r+4;u+8;16
7080 VDU18,0,128,24,1-4;d;r;u+4;16,26
7090 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                          5130 PROCpoutline(1,INT(M%/2),t$)
6130 PROCpoutline(INT(M%/2)+1,M%,t$)
6120 VDU 2,1,27,1,64,3,12
6130 ENDPROC
                                                                                                                                                                                        5120 IF NOT realfit loop=LENw$
                                                                                                                                                                                       5130 NEXTLOOP
5130 NEXTLOOP
5140 IF NOT realfit THEN =FALSE
5150 FOR loop=1 TO LENW$
5160 CW*(CX,CY-wl+loop)=ASCNID$(w$,loop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7100 :
7110 DEF PROCCIS
7120 PROCWIND(1,11,37,19,0)
7130 PROCWIND(21,1,17,11,0)
7140 ENDPROC
7150 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7100 :
                                                                                                                                                                                                                                                                                                                                                                           6140 :
                                                                                                                                                                                                                                                                                                                                                                            6150 DEF PROCpoutline(start, end, t$)
                                                                                                                                                                                                                                                                                                                                                                           6160 COLOUR129:CLS:COLOUR128
6170 db$=CHR$10+CHR$8+CHR$8:up$=CHR$(11
       4270 NEXTCloop
4280 =dumfit
                                                                                                                                                                                        517Ø NEXT
                                                                                                                                                                                        5180 cl(x,0)=cx
5190 cl(x,1)=cy-wl+1
5200 cl(x,2)=0
5210 =TRUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7150 :
7160 DEF PROCMESS(t$,y)
                                                                                                                                                                                                                                                                                                                                                                           6180 blk$=CHR$(158)+CHR$(158)+db$+CHR$(
      4398 DF FNfithup(w$,pos)
4308 DEF FNfithup(w$,pos)
4318 ltf=LENY$(pos)
4328 startx=cl(pos,0)
4338 starty=cl(pos,1)+ltf
4348 LOCALCloop,wloop,dumfit
4358 dumfit=FALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7100 x=19-INT((LENTE)/2)
7100 x=19-INT((LENTE)/2)
7100 PROCWIND(x,y,LEN(t$),0,1)
7100 COLOUR128:COLOUR 7
7200 PRINTIAB(x,y);t$;
7210 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                      158)+CHR$(158)+up$
6190 opn$=CHR$(32)+CHR$(155)+db$+CHR$(1
56)+CHR$(157)+up$
                                                                                                                                                                                   5228 :
5238 DEF FMFVp(loop,w$,xl,yl)
5248 DF FMFVp(loop,v$,xl,yl)
5258 DF (yl-loop) 08 THEN =FALSE
5258 DF (yl-loop) ND cw4(xl,yl) <>
5268 DF (cv4(xl,yl) <>
0 AND cw4(xl,yl) <>
5278 DF (xl-l)-wh THEN DF (cw4(xl+l,yl) <>
>>
68 AND cw4(xl,yl) <>
ASCMID$(w$,loop,l)) THEN =FALSE
5278 DF (xl-l)-wh THEN DF (cw4(xl+l,yl) <>
>>
68 AND cw4(xl,yl) <>
ASCMID$(w$,loop,l))
THEN =FALSE
                                                                                                                                                                                        5220 :
                                                                                                                                                                                                                                                                                                                                                                          6200 LOCALX,y
6210 VDU30
6220 FOR y=start TO end:FOR x=1 TO M%
6230 IF cw%(x,y)=0 PRINTDL%;:ELSE PRIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7220 :
7230 DEF PROCinf(i$(0),i$(1),i$(2))
       4360 FOR cloop=starty TO starty-ltf STE
For Volocion to Einst
4376 FOR wloops To Leinst
4386 IF cloopself THEN IF cw4(startx,cl
cop)=ASCMID$(w$,wloop,1) dumfit=FNtryfit
h(startx,cloop,wloop,w$)
4398 IF dumfit wloop=LENN$
4460 MEXTwloop
4419 IF dumfit cloop=starty-ltf
4420 NEXTwloop
4430 = dumfit
4440 i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7240 FOR 1%-0 TO 2
7240 FOR 1%-0 TO 2
7250 PRINTTAB(26,11+1%);SPC12
7250 PRINTTAB(26,11+1%);i$(1%)
7270 NEXT
7280 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                      Topn$;
6240 NEXT:IF y<>end PRINT
                                                                                                                                                                                                                                                                                                                                                                     6240 NEXT:IF yc>end PRINT
6250 NEXT
6260 PROCnumerate(start,end)
6270 MOVE 0,0:DRAMO,671
6280 IF 15="L" PROCdump(16,960,3) RLSE
PROCdump(32,640,1)
                                                                                                                                                                                   | 300 AND CW(XL,Y1) CASCRIDE(WS,100P,1)|
THEN =PALS|
5260 IF (x1-1)=0 THEN IF (cwk(x1-1,y1)
**O9 AND cwk(x1,y1) CASCRID$(w$,100P,1))
THEN =PALS|
5290 IF (y1+1) CAN THEN IF (cwk(x1,y1+1)
**Y00 AND Cwk(x1,y1+1) CASCRID$(w$,100P+1)
**L1) THEN =PALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7290 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7300 DEF PROCEDO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7310 PROCWING(26,11,11,2,1)
7320 PROCINF("Press SPACE", "to return",
                                                                                                                                                                                                                                                                                                                                                                           629Ø ENDPROC
                                                                                                                                                                                                                                                                                                                                                                          6310 DEF PROCnumerate(s,e)
                                                                                                                                                                                       5300 IF cw%(x1,y1-loop)<>0 THEN =FALSE
5310 =TRUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              to menu.")
7330 REPEAT:SOUND 1,1,4,20:UNTIL INKEY(
                                                                                                                                                                                                                                                                                                                                                                           6320 LOCALLoop
6330 FOR loop=1 TO words
6340 IF cl(loop,1)>=s AND cl(loop,1)<=e
       4440 :
    4440 :

4450 DEF Phtryfith(cx,cy,wl,w$)

4450 LOCAL loop, realfit

4470 realfit=FALSE

4480 FOR loopel TO LENW$

4490 realfit=FNfhp(loop,w$,cx-wl+loop,c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7340 PROCCIS
7350 ENDPROC
                                                                                                                                                                                       5330 DEF FNxsave
5340 IF cwd=0 PROCem("No crossword to s
                                                                                                                                                                                                                                                                                                                                                                          PROCputno(cl(loop,0),cl(loop,1)-(s-1),c
                                                                                                                                                                                                                                                                                                                                                                     RNCCPULDB(C1(100p,0),C1(100p,1)-(8-1(100p,1))
6350 NEXT
6360 ENDPROC
6370:
6380 DEF PROCPULDB(x,y,n)
6390 xc(x-1)*64+4:y=664-((y-1)*64)
6400 VDU5
6410 IP no.10 NOVER NUMBER 10 DESCRIPTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7350 :
7370 DEF PROCem(t$)
7380 PROCess(t$,29)
7390 SOUNDI,1,4,10:a=INKEY200
                                                                                                                                                                                   ave")::0
5350 f$=FNsname("crossword","X")
5360 IP f$="" PROCcls::0
5370 PROCmess("Please wait: Crossword S
aving",:2)
5380 av=0PENOUTf$
      4500 IF NOT realfit loop=LENW$
      4510 HEXTLOOP
4520 IF NOT realfit THEM =FALSE
4530 FOR loop=1 TO LENW$
4540 cw4(cx-w1+loop,cy)=ASCHID$(w$,loop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7400 PROCcis
                                                                                                                                                                                                                                                                                                                                                                        6400 VDU5

6410 IF n>=10 MOVEX,y:VDU128+(n DIV 10)

in = n MOD 10:x=x+16

6420 MOVEX,y:VDU128+n

6430 VDU4

6440 ENDPROC

6440 6440 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              741Ø ENDPROC
                                                                                                                                                                                     5386 a%=0PENOUTÉ

5390 PRINT #a%, words

5400 POR I%=1 TO words

5410 PRINT#a%, w% (I%)

5420 NRIT

5430 PRINT #a%, I%

5440 POR I%=1 TO I%

5450 POR J%=1 TO I%

5450 POR J%=1 TO IM

5450 POR J%=1 TO IM

5450 POR J%=1 TO IM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7420 :

7430 EF FNgpi(len,effect,valid$)

7440 FROCcurs(1)

7450 LOCALA$,b

7450 $=""

7470 PRINTSTRING$(len,".");STRING$(len,
      4550 NEXT
     4560 cl(x,0)=cx-wl+1
4570 cl(x,1)=cy
4580 cl(x,2)=1
4590 =TRUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7476 PRINTSTRINGS(len, "."); STRINGS(len, CRRS(8)); REMEYRIS.]
7480 b=GET:IF b=13 PROCCUTS(0):=a$
7480 IF b:32 THEN 7480
7580 IF b:127 AND a$5="THEN 7480
7510 IF b=127 AS=LEFFS(a$,LER(a$)-1):PR
INTCHR$b; "."; CHR$(8); GOTO7480
7520 IF effect=0 THEN7550
7530 IF effect=0 THEN7550
7530 IF effect=1 b=b AND 223 ELSE b=b 0
R32
                                                                                                                                                                                                                                                                                                                                                                          6460 DEF PROCOUMP(st,n,b)
6470 FOR Y%=671 TO 31+st STEP -st
6480 VDU 2,1,27,1,76,1,n MOD256,1,n DIV
4600:
4610 DEF FNfhp(loop,w$,xl,yl)
4620 IF (xl-loop)<br/>
60 TEEN = FALSE
4630 IF (xl-loop)<br/>
60 TEEN = FALSE
4630 IF (xl-loop)<br/>
AND cw4(xl,yl)<br/>
ASCHID$(w$,loop,l)) THEN =FALSE
4650 IF (yl-l)<br/>
60 AND cw4(xl,yl)<br/>
ASCHID$(w$,loop,l))<br/>
FREN =FALSE
670 IF (yl-l)<br/>
680 AND cw4(xl,yl)<br/>
680 AN
                                                                                                                                                                                      5400 BPUTWAS, CW4(1%,U%)
5470 NEXT
5480 FOR J%=0 TO 3
5490 PRINTWAS, cl(1%,U%)
5500 NEXT
5510 NEXT
                                                                                                                                                                                                                                                                                                                                                                      256
6490 FOR X%=0 TO 1276 STEP 4:A%=0
6500 FOR X%=0 TO st-4 STEP 4
6510 A%=A%*(b+1)+POINT(X%, Y%-Z%)*b
                                                                                                                                                                                       5520 CLOSE#a%
                                                                                                                                                                                                                                                                                                                                                                           6520 NEXT
                                                                                                                                                                                     5520 NEXT
6530 PRINTSTRING$(n/320,CHR$1+CHR$A%);
6540 NEXT:IF Y%<>st VDU 1,10
6550 NEXT:VDU 3
6560 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7540 IF effect=3 AND(RIGHT$(a$,1)=" " O
R a$="") b=b AND 223
7550 IF LEN(a$)=len OR INSTR(walid$,CHR
$b)=0 SOUND1,1,4,20:GOTO7480
     THEN -PALSE
THEM = PALSE 4569 IF (yl-1)>=0 THEM IF (cw%(xl,yl-1)>0 AND cw%(xl,yl) \leftrightarrow ASCMID$(w$,loop,l)) THEM = PALSE 4670 IF (xl+1)<\leftrightarrow THEM IF (cw%(xl+1,yl) \leftrightarrow ASCMID$(w$,loop+1).1) THEM = PALSE
                                                                                                                                                                                                                                                                                                                                                                          657Ø :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7560 PRINTCHR$b;:a$=a$+CHR$b:GOTO7480
                                                                                                                                                                                                                                                                                                                                                                         05/0:

6580 DEF FNdel(d$)

6590 f$=FNlname("Delete file",d$)

6690 FF f$<>"" PROCoscli("DRLETE "+f$)

6610 PROCcls:VDU 26

6620 =0

6630 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7550 PRINTCHRED;:a$=a$+CHRED:GOTO74
7570:
7580 DEF PROCOUGLI($blk)
7590 LOCAL X$,Y$
7600 X$=blk MOD 256:Y$=blk DIV 256
7610 CALL &FFF7
7620 ENDPROC
                                                                                                                                                                                 DOUGH PROCESS ("Please walt: Cro
oading", 29)

5600 cwd=0:words=0:a%=OPENUPf$

5610 INPUT %ak, words

5620 FOR I%=1 TO words

5630 INPUT %ak, w$(I%)
     4680 IF cw4(x1-loop,y1)<>0 THEN =FALSE
4690 =TRUE
                                                                                                                                                                                                                                                                                                                                                                     6630 : 6
6640 DEF FNCat(c$,f)
6659 PRCCwind(1,17,37,10,1)
6669 PRCCmess("Files available:",15)
6669 PRCCmess("Files available:",15)
6670 VDU 281,27,38,17:t=8:p=0
6680 PRCCmess("DIR "+c$)
6690 PRCCmess("DIR "+c$)
6690 PRCCmess("DIR "+c$)
6790 PRCCM DED 15-1cALLEFFD1
6730 IF cost5-50 cost1-blk: (blk+1-?blk)
=13:PRINTTAB(p);$(blk+1);:t=t+1
6730 p-p+12:IF p=36 p=0:PRINT
6740 UNTIL ost5=1
6750 IF f=0 PRINTTAB(16,4);"(none>"
6760 IF f=PRCCSpc
6770 *DIR $
6780 REN*DIR 1980.NOV.DISC
6730 = t
     4718 DEF FNfitv(w$,pos)
4728 dumdir=RND(2)
4738 IP dumdir=1 THEN =FNfitvleftright(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7630 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7640 DATA Main Menu, 1, 1, 4, 9
                                                                                                                                                                                       5640 NEXT
5650 INPUT #a%, M%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7640 DATA Main Menu,1,1,4,9
7550 DATA Nords,Clues,Gride,Quit
7650 DATA Nords,Clues,Gride,Quit
7650 DATA New,Save,Load,Display,Print,C
atalog,Delete,<
7680 DATA Format,21,1,3,6
7690 DATA Tight,Open,<
7700 DATA Method,21,1,4,6
7710 DATA Daff,Small,Large,<
7720
                                                                                                                                                                                      5050 INPUT #84, NY
5660 FOR J%=1 TO M%
5690 FOR J%=1 TO M%
5690 MEXT
5700 FOR J%=0 TO 3
5710 INPUT #84, C1(I%, J%)
5720 EVER
     4740 IF dumdir=2 THEN =FNfityrightleft(
 w$,pos)
4750 =FALSE
    4750 = PALSE
4760 :
4770 DEF FMfitwleftright(w$,pos)
4780 startx=cl(pos,0)
4790 starty=cl(pos,1)
4800 ltf=LENW$(pos)
                                                                                                                                                                                       5720 NEXT
                                                                                                                                                                                       573Ø NEXT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7720:
7730 DATA wenter(""), wsave, wload, lista(3), lista(2), "cat(""N"",1)", del("N")
7740 DATA center(""), csave, cload, listo(3), listo(2), "cat("c"",1)", del("c")
7755 DATA build, xsave, xload, dword(3), pmenu, "cat(""X"",1)", del("X")
                                                                                                                                                                                       5740 CLOSE #a%
    4806 LITELENNS(DOS)
4818 LOCALCHOP, WHOOP, dumfit
4828 dumfit=FALSE
4838 FOR cloop=startx TO startx+ltf
4848 FOR WHOOP=1 TO LENNS
4858 IF cloop<=Mt THEN IF cw%(cloop, sta
                                                                                                                                                                                       5750 cwd=1
                                                                                                                                                                                     5750 CWd=1
5760 PROCcls
5770 =0
5780 :
5790 DEF FNdword(v)
```

|  |  |  | Menu Editor   |
|--|--|--|---|
| Listing l  | 1000 DATA 77,77,77,77,77,77,77,77,0<br>1010 DATA 0,F0,FF,FF,FF,FF,FF,FF,FF               | 30 REM for Archimedes only<br>40 REM (c) BAU Nov '91                   | 1000 SYS "Hourglass_Percentage",t%*49/m<br>enus%                                  |
| uisting i  | 1020 DATA FF,FF,0,0,0,0,0,0,0  | 50 :   | 1010 NEXT   |
| 10 REM >MakeApp (Menued1)  | 1030 DATA 0,0,0,F0,FF,FF,FF,FF,FF<br>1040 DATA FF,FF,FF,FF,0,0,0,0,0                     | 60 file_open%=FALSE<br>70 ON ERROR PROCETTOT                           | 1020 indir%=store%<br>1030 store%=mn%+4*menus%+1                                  |
| 20 REM Create application directory<br>30 REM (c) BAU November 1991      | 1050 DATA 0,0,0,0,0,F0,FF,FF,FF  | 80 DIM q% &200, ind% &100, error% &200,                                | 1040 PTR#file%=p%   |
| 40 :   | 1060 DATA FF,FF,FF,FF,FF,FF,0,0,0  | menu% &80,mn% &C000,in%(100)<br>90 \$q%="TASK"                         | 1050 FORt%=1TOmenus%<br>1060 PROCmkmenu(1)  |
| 50 PRINT "Creating application direct<br>ry"                             | 1070 DATA 0,0,0,0,0,0,F0,FF<br>1080 DATA FF,FF,FF,FF,FF,FF,FF,F                          | 100 SYS "Wimp_Initialise",200,!q%,"Men                                 | 1070 SYS "Hourglass_Percentage", t%*49/m  |
| 60 *CDIR \$.!MenuED  | 1090 DATA 0,0,0,0,0,0,0,0,0  | uEd"   | enus%+50<br>1080 NEXT   |
| 70 *DIR \$.!MenuED<br>80 PROCcreaterunfile                               | 1100 DATA F0,FF,FF,FF,FF,FF,FF,FF,FF<br>1110 DATA FF,0,0,0,0,0,0,0,0                     | 110 SYS "Wimp_OpenTemplate",," <menued\$ dir="">.Templates"</menued\$> | 1090 CLOSE#file%:file_open%=FALSE   |
| 90 PROCcreatespritesandtemps   | 1120 DATA 0,0,F0,FF,FF,FF,FF,FF,FF   | 120 SYS "Wimp_LoadTemplate",,q%,ind%,i<br>nd%+&100,-1,"Info",0         | 1100 PROCdataloadack<br>1110 SYS "OS_File", 10, FNr(a\$) + "Menus", &             |
| 100 PRINT "Application created, now pu<br>!Runimage inside it."          | 1130 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF<br>1140 DATA FF,FF,0,0,F0,FF,FF,FF,FF               | 130 SYS "Wimp_CreateWindow",,q% TO inf                                 | FEC, ,mn%, indir%   |
| 110 CLOSE #0   | 1150 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF   | owind%   | 1120 SYS "Hourglass_Off":hour%=FALSE<br>1130 ENDPROC                              |
| 120 END<br>130 :   | 1160 DATA FF,FF,FF,FF,0,0,F0,FF,FF<br>1170 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF               | 140 SYS "Wimp_CloseTemplate" 150 PROCmenu                              | 1140 :  |
| 140 DEF PROCcreaterunfile  | 1180 DATA FF,FF,FF,FF,FF,FF,0,0,F0   | 160 menu_icon%=FNiconbar   | 1150 DEF FNr(a\$)<br>1160 WHILE RIGHT\$(a\$,1)<>"."                               |
| 150 out%=OPENOUT "!Run"<br>160 BPUT #out%,"  > !MenuEd.!Run"             | 1190 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF<br>1200 DATA FF,FF,FF,FF,FF,FF,FF,FF,0              | 170 ON ERROR PROCETTOT<br>180 hour%=FALSE                              | 1170 a\$=LEFT\$(a\$)  |
| 170 BPUT #out%, " "  | 1210 DATA 0,F0,FF,FF,FF,FF,FF,FF,FF  | 190 :  | 1180 ENDWHILE   |
| 180 BPUT #out%, "Set MenuEd\$Dir <0bey\$D                                | 1220 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF<br>1230 DATA FF,0,0,F0,FF,FF,FF,FF,FF               | 200 REPEAT<br>210 :  | 1190 =a\$<br>1200 :   |
| 190 BPUT #out%, "WimpSlot -min 64K -max                                  | 1240 DATA FF,FF,FF,FF,FF,FF,FF,FF  | 220 SYS "Wimp_Poll", &FFF9FDBD, q% TO ev                               | 1210 DEF PROCMkmenu (pass%)   |
| 64K"   | 1250 DATA FF,FF,FF,0,0,F0,FF,FF,FF<br>1260 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF               | ent%<br>230 :  | 1220 LOCALname\$,flag\$,valid\$,c%<br>1230 mn%!(4*t%-3)=store%-ms%                |
| 200 BPUT #out%, "Run "" <obey\$dir>.!RunI age"""</obey\$dir>             | 1270 DATA FF,FF,FF,FF,FF,0,0,F0,FF   | 240 CASE event% OF   | 1240 \$store%=FNget   |
| 210 BPUT #out%, " "  | 1280 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF   | 250 WHEN 2:SYS "Wimp_OpenWindow",,q%                                   | 1250 IFLEN(\$store%)>12 ERROR1, "Menu tit<br>le too long"                         |
| 220 CLOSE #out%<br>230 *Settype !Run Obey                                | 1290 DATA FF,FF,FF,FF,FF,FF,FF,0,0<br>1300 DATA FO,FF,FF,FF,FF,FF,FF,FF,FF               | 260 WHEN 6:IF q%!12=-2 AND q%!16=menu_<br>icon% THEN PROCmouse(q%)     | 1260 width%=store%+16   |
| 240 PRINT "Runfile created"  | 1310 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF   | 270 WHEN 9:IF !q%=1 END  | 1270 !width%=16*LEN(\$store%)-32  |
| 250 ENDPROC<br>260 :   | 1320 DATA 0,0,0,FF,FF,FF,FF,FF,FF<br>1330 DATA FF,FF,FF,FF,FF,FF,FF,FF,FF                | 280 WHEN 17,18:CASE Q%:16 OF<br>290 WHEN 0:END                         | 1280 store%+=12<br>1290 !store%=&70207  |
| 260 :<br>270 DEF PROCcreatespritesandtemps                               | 1340 DATA FF,FF,0,0,0,0,0,0,0  | 300 WHEN 3:IF q%!20=-2 AND q%!24=menu_                                 | 1300 store%!8=40  |
| 280 file%=OPENOUT "!Sprites"   | 1350 DATA 0,0,0,0,F0,FF,FF,FF,FF   | icon% AND q%!40=&FFF THENPROCconvert_to_<br>menufile                   | 1310 store%!12=0<br>1320 store%+=16   |
| 290 REPEAT<br>300 READ number\$  | 1360 DATA FF,FF,FF,FF,0,0,0,0,0<br>1370 DATA 0,0,0,0,0,0,FF,FF                           | menurile<br>310 ENDCASE  | 1330 REPEAT   |
| 310 IF number\$<>"END OF SPRITE DATA" T                                  | 1380 DATA FF,FF,FF,FF,FF,FF,0,0,0  | 320 ENDCASE  | 1340 name\$=""  |
| EN 320 number%=EVAL("&"+number\$)  | 1390 DATA 0,0,0,0,0,0,0,0,F0<br>1400 DATA FF,FF,FF,FF,FF,FF,FF,FF,0                      | 330 UNTIL FALSE<br>340 :   | 1350 flag\$=""<br>1360 valid\$=""   |
| 330 BPUT #out%, number%  | 1410 DATA 0,0,FE   | 350 DEF PROCmouse(q%)  | 1370 PROCreadentry(name\$,flag\$,valid\$)   |
| 340 ENDIF  | 1420 DATA END OF SPRITE DATA   | 360 IF q%18=2 THEN SYS "Wimp_CreateMen<br>u",,menu%,!q%-64,176         | 1380 FOR1c%=1TOLENflag\$<br>1390 ch\$=MID\$(flag\$,1c%,1)                         |
| 350 UNTIL number\$="END OF SPRITE DATA" 360 CLOSE #file%                 | 1430 :<br>1440 REM Template data   | 370 ENDPROC  | 1400 IFINSTR("cbmwtlsiep",ch\$)THENMID\$  |
| 370 *SetType !Sprites Sprite   | 1450 :   | 380 :  | flag\$,1c%,1)=CHR\$(ASC(ch\$)-32)   |
| 380 PRINT "Sprites created" 390:   | 1460 DATA FF,FF,FF,FF,0,0,0,0,0<br>1470 DATA 0,0,0,0,0,0,2C,0                            | 390 DEF FNiconbar<br>400 LOCAL i%                                      | 1410 NEXT<br>1420 IFLENname\$*16>!width%ANDNOTFNin("                              |
| 400 file%=OPENOUT "Templates"  | 1480 DATA 0,0,CA,1,0,0,1,0,0   | 410 q%!0=-1  | ")THEN !width%=LENname\$*16   |
| 410 REPEAT   | 1490 DATA 0,49,6E,66,6F,D,0,0,0  | 420 q%!4=0<br>430 q%!8=0   | 1430 !store%=FNin("T")+2*FNin("L")+4*F<br>in("I")+8*FNin("W")+128*FNin("E")       |
| 420 READ number\$ 430 IF number\$<>"END OF TEMPLATE DATA"                | 1500 DATA 0,0,0,0,0,0,0,0,DC<br>1510 DATA 0,0,0,C8,1,0,0,46,3                            | 440 q%:12=68   | 1440 IFFNin("M")+FNin("W")=2 ERROR1,"T  |
| HEN  | 1520 DATA 0,0,9C,2,0,0,0,0,0   | 450 q%!16=96   | o submenu pointers" 1450 indirect%=FALSE  |
| 440 number%=EVAL("%"+number\$) 450 BPUT #out%, number%                   | 1530 DATA 0,0,0,0,0,78,7,0,0<br>1540 DATA 12,0,3,84,7,2,7,1,C                            | 460 q%!20=&2002<br>470 \$(q%+24)="!MenuEd"                             | 1460 store%!4=-1  |
| 460 ENDIF  | 1550 DATA E,2,0,0,0,0,0,0,FC   | 480 SYS "Wimp_CreateIcon",,q% TO i%                                    | 1470 IFFNin("M")store%!4=-1-FNval("M")  |
| 470 UNTIL number\$="END OF TEMPLATE DAT                                  | 1560 DATA FF,FF,0,5,0,0,0,0,0<br>1570 DATA 0,3D,1,0,0,0,30,0,0                           | 490 =1%<br>500 :   | 1480 IFFNin("W")store%!4=FNval("W")<br>1490 IFLENname\$>12ORFNin("I")ORFNin("P    |
| " 480 CLOSE #file%   | 1580 DATA 1,0,0,0,0,0,0,0,78   | 510 DEF PROCmenu   | ) indirect%=TRUE  |
| 490 *SetType Templates Template  | 1590 DATA 1,0,0,FF,FF,FF,FF,13,0   | 520 \$menu%="MenuEd"   | 1500 IF16*FNval2("I")>!width%THEN!widt:<br>%=16*FNval2("I")                       |
| 500 PRINT "Templates created" 510 ENDPROC                                | 1600 DATA 0,0,9,0,0,0,A4,2,0<br>1610 DATA 0,34,FF,FF,FF,54,3,0,0                         | 530 menu%!12=&70207<br>540 menu%!16=&50                                | 1510 c%=7   |
| 520 :  | 1620 DATA 64,FF,FF,FF,3D,30,0,B7,4F  | 550 menu%!20=40  | 1520 IFFNin("C")c%=FNval("C")   |
| 530 REM Sprite data<br>540 :   | 1630 DATA 4B,D,74,69,74,6C,65,64,3E<br>1640 DATA D,FE,9A,0,0,0,CC,FF,FF                  | 560 menu%124=0<br>570 menu%128=0                                       | 1530 store%!8=49+FNin("P")+indirect%*-<br>56+(FNin("S")<<22)+(c%<<24)+(FNval("B") |
| 550 DATA 1,0,0,0,10,0,0,0,C  | 1650 DATA FF,66,2,0,0,FC,FF,FF,FF  | 580 menu%!32=infowind%   | <28)  |
| 560 DATA 3,0,0,FC,2,0,0,21,6D  | 1660 DATA 3D,61,0,7,88,1,0,0,FF  | 590 menu%!36=&7000019<br>600 \$(menu%+40)="Info"                       | 1540 IFindirect%THEN<br>1550 IFpass%=1THEN  |
| 570 DATA 65,6E,75,65,64,0,0,0,0<br>580 DATA 0,4,0,0,0,11,0,0,0           | 1670 DATA FF,FF,FF,28,0,0,0,9A,0<br>1680 DATA 0,0,98,FF,FF,FF,66,2,0                     | 610 menu%152=128   | 1560 IFFNin("I") AND NOT FNin("P") THEN   |
| 590 DATA 0,0,0,0,7,0,0,0,2C  | 1690 DATA 0,C8,FF,FF,FF,3D,61,0,7  | 620 menu%:56=0   | 1570 store%!12=indir%-ms%   |
| 600 DATA 0,0,0,94.1,0,0,C,0<br>610 DATA 0,0,77,77,77,77,77,77            | 1700 DATA 92,1,0,0,FF,FF,FF,FF,28<br>1710 DATA 0,0,0,9A,0,0,0,64,FF                      | 630 menu%:60=&7000019<br>640 \$(menu%+64)="Quit"                       | 1580 \$indir%=name\$<br>1590 indir%+=FNval("I")+1                                 |
| 620 DATA 77,77,77,77,77,77,77,77   | 1720 DATA FF,FF,66,2,0,0,94,FF,FF  | 650 ENDPROC  | 1600 store%!20=FNval("I")+1   |
| 630 DATA 77,0,0,70,27,22,22,22,22  | 1730 DATA FF,3D,61,0,7,A2,1,0,0<br>1740 DATA FF,FF,FF,FF,28,0,0,0,9A                     | 660 :<br>670 DEF PROCdataloadack                                       | 1610 ELSE<br>1620 store%!12=indir%-ms%  |
| 640 DATA 22,22,22,72,77,77,77,77,77<br>650 DATA 77,77,77,0,0,70,77,77,77 | 1750 DATA 0,0,0,30,FF,FF,FF,66,2   | 680 q%!12=q%!8   | 1630 \$indir%=name\$  |
| 660 DATA 77,77,77,77,77,77,77,77   | 1760 DATA 0,0,60,FF,FF,FF,3D,61,0  | 690 q%!16=4  | 1640 valid\$=""<br>1650 indir%+=LENname\$+1                                       |
| 670 DATA 77,77,77,77,77,0,0,70,7<br>680 DATA 0,0,0,0,0,0,0,70,77         | 1770 DATA 7,89,1,0,0,FF,FF,FF,FF<br>1780 DATA 1E,0,0,0,3E,0,0,0,D0                       | 700 SYS "Wimp_SendMessage", 17, q%, q%!4 710 ENDPROC                   | 1660 store%!20=LENname\$+1  |
| 690 DATA 77,77,77,77,77,77,0,0   | 1790 DATA FF,FF,FF,9A,0,0,0,F8,FF  | 720 :  | 1670 ENDIF  |
| 700 DATA 70,7,70,77,70,77,77,77,77 710 DATA 70,77,77,77,77,77,77,77      | 1800 DATA FF, FF, 39, 0, 0, 17, 4E, 61, 6D<br>1810 DATA 65, 3A, D, 6C, 65, 64, 3E, D, FE | 730 DEF PROCERTOR 740 SYS "XWimp_CreateMenu",,-1                       | 1680 IFFNin("P")THEN<br>1690 store%!16=1  |
| 720 DATA 0,0,70,7,0,0,0,0,0  | 1820 DATA E,0,0,0,9C,FF,FF,FF,9A   | 750 IF file_open% THEN CLOSE#file%                                     | 1700 ELSE   |
| 730 DATA 0,0,70,77,77,77,77,77   | 1830 DATA 0,0,0,C4,FF,FF,FF,39,0   | 760 IF hour% SYS "Hourglass_Off"                                       | 1710 store%!16=indir%-ms%<br>1720 \$indir%=valid\$                                |
| 740 DATA 77,77,0,0,70,7,70,77,77<br>750 DATA 77,70,77,7,70,22,22,22,22   | 1840 DATA 0,17,50,75,72,70,6F,73,65<br>1850 DATA 3A,D,3E,D,FE,1E,0,0,0                   | 770 !error%=ERR<br>780 \$(error%+4)=REPORT\$+": Internal er            | 1730 indir%+=LENvalid\$+1   |
| 760 DATA 22,22,22,72,0,0,70,7,0  | 1860 DATA 68,FF,FF,FF,9A,0,0,0,90  | ror code ("+STR\$ERL+")"+CHR\$Ø  | 1740 ENDIF  |
| 770 DATA 0,0,0,0,0,0,70,77,77<br>780 DATA 77,77,77,77,77,77,0,0,70       | 1870 DATA FF,FF,FF,39,0,0,17,41,75<br>1880 DATA 74,68,6F,72,3A,D,64,3E,D                 | 790 SYS "Wimp_ReportError", error%, 3, "M enuEd"TO, j%                 | 1750 ENDIF<br>1760 ELSE   |
| 790 DATA 7,70,77,77,77,70,7,70   | 1890 DATA FE,E,0,0,0,38,FF,FF,FF   | 800 IF j%=2 END  | 1770 \$(store%+12)=name\$   |
| 800 DATA 0,0,0,0,0,0,0,70,0  | 1900 DATA 9A,0,0,60,FF,FF,FF,39<br>1910 DATA 0,0,17,56,65,72,73,69,6F                    | 810 ENDPROC<br>820 :   | 1780 ENDIF<br>1790 store%+=24   |
| 810 DATA 0,70,7,0,0,0,0,0,0<br>820 DATA 0,70,0,7,77,77,77,77,7           | 1920 DATA 6E, 3A, D, 3E, D, FE, 41, 62, 6F   | 830 DEF PROCconvert_to_menufile  | 1800 UNTILFNin("E")=1   |
| 830 DATA 70,0,0,70,7,70,70,77,77   | 1930 DATA 75,74,20,74,68,69,73,20,50   | 840 SYS "Hourglass_On":hour%=TRUE                                      | 1810 !width%+=16<br>1820 ENDPROC  |
| 840 DATA 77,77,7,70,0,0,0,0,0,0<br>850 DATA 0,0,70,0,0,70,7,0,0          | 1940 DATA 72,6F,67,72,61,6D,D,4D,65<br>1950 DATA 6E,75,45,64,D,54,65,6D,70               | 850 file%=q%+44<br>860 a\$=""  | 1830 :  |
| 860 DATA 0,0,0,0,0,70,0,77,77  | 1960 DATA 6C,61,74,65,20,45,64,69,74   | 870 WHILE?file%>31   | 1840 DEF FNget  |
| 870 DATA 77,7,77,77,70,0,0,70,7  | 1970 DATA 6F,72,D,A9,20,54,6F,6E,79<br>1980 DATA 20,50,61,74,74,65,72,73,6F              | 880 a\$+=CHR\$(?file%)<br>890 file%+=1                                 | 1850 LOCALa\$<br>1860 REPEAT  |
| 880 DATA 70,77,77,70,77,77,70,0<br>890 DATA 0,0,0,0,0,0,70,0,0           | 1990 DATA 6E,2C,20,31,39,39,31,D,31  | 900 ENDWHILE   | 1870 a\$=FNstrip(GET\$#file%)   |
| 900 DATA 70,7,0,0,0,0,0,0,0  | 2000 DATA 2E,30,30,20,28,30,37,2D,41   | 910 file%=OPENINa\$:file_open%=TRUE                                    | 188Ø UNTILLEFT\$(a\$,1)<>"%"  |
| 910 DATA 70,0,77,7,77,77,77,77,70<br>920 DATA 0,0,70,77,77,77,77,77      | 2010 DATA 70,72,2D,39,31,29,D,FE<br>2020 DATA END OF TEMPLATE DATA                       | 920 menus%=VAL(FNget)<br>930 ?mn%=menus%                               | 1890 =a\$<br>1900 :   |
| 930 DATA 77,77,77,0,0,0,0,0,0  |  | 940 ms%=mn%+4*menus%+1   | 1910 DEF PROCreadentry (RETURN n\$, RETUR   |
| 940 DATA 0,70,0,0,0,77,77,77,77  | Listing 2  | 950 store%=ms%<br>960 p%=PTR#file%                                     | f\$, RETURN v\$)<br>1920 LOCALA\$, c%   |
| 950 DATA 77,77,77,77,77,0,77,77,77<br>960 DATA 77,7,7,70,0,0,70,0,0      |  | 970 SYS "Hourglass_Percentage",0                                       | 1930 A\$=FNget  |
|  |  | 98Ø FORt%=1TOmenus%  | 1940 c%=INSTR(A\$,"(")  |
| 970 DATA 0,0,0,0,0,70,0,0<br>980 DATA 0,0,0,0,0,70,0,0                   | 10 REM > <menued\$dir>.!RunImage (MenuE<br/>d2)</menued\$dir>                            | 990 PROCmkmenu(0)  | 1950 IFc%=0n\$=FNstrip(A\$):ENDPROC   |



```
1970 AS=MID$(A$,c%+1)
1980 C%=INSTR(A$,")")
1990 IPC%>05%=INSTR(A$,"c%-1)
2000 C%=INSTR(A$,"(")
2010 IPC%>07%=INSTR(A$,")"
2010 IPC%>07%=INSTR(A$,")
2010 IPC%>07%=I
                                                                                                                                                                                250 IF (menuptr%:-16 AND 256)=256 THEN 260 f%=menuptr%-12 261 if%+smen% 270 IF f%:4=1 THEN f%:4=spritearea% EL SE f%:4+=men%
                                                                                                                                                                                                                                                                                                                                                                           480 .loadmenu_loop
490 MOV R0,#4
500 MOV R1,handle
510 MOV R3,#28
520 SWI "OS_GBPB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             num=parameters.r[0];
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /* Dimension size of menu */
                                                                                                                                                                                                                                                                                                                                                                          510 MOV R3,#28

520 SWI "OS_GBPB"

530 .read_option

540 MOV R0,#4

550 MOV R1,handle

560 MOV R3,#24
                                                                                                                                                                                         280 ENDIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              os_args(&parameters);
men=malloc(parameters.r[2]);
                                                                                                                                                                                          290 UNTIL (menuptr%!-24 AND128)=128
                                                                                                                                                                                          300 NEXT
310 SYS &C,4,file%,menuptr%,1<<16 TO,,
     2040 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                        550 MOV R1, handle
560 MOV R3, #24
570 SMI "OS_GBPB"
580 LDR R0, [R2,#-20]
590 CMN R0, #1
600 WWNLT R0, R0, LSL #2
610 SUBLT R0, R0, #2
620 LDRLT R0, R0, #2
630 STRLT R0, R0, #2
650 ANDS R0, R2,#-12
650 ANDS R0, R2,#-16
650 ANDS R0, R2,#-16
650 EBG no_indirection
670 LDR R0, R2,#-16
680 CMP R0, #1
690 STREO STREO SPITLES, [R2,#-12]
700 ADDNE R0, R0, #2
710 STRNE R0, R2, #-12
710 STRNE R0, R2, #-12
710 STRNE R0, R2, #-12
710 ADDNE R0, R0, M0, M1fer2
710 ADDR R0, R0, M0, M128
710 ADDR R0, R0, M0, M128
710 ADDR R0, R0, M0, M128
710 ADDR R0, R0, M128
710 ADDR R0, R128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /* Read in parameters block */
parameters.r[0]=4;
parameters.r[1]=handle;
parameters.r[2]=(int)buffer;
parameters.r[3]=num*4;
os_swi(OS_GBPB,&parameters);
     2050 :

2060 DEF FNstrip(a$)

2070 WHILEASC(a$)=32

2080 a$=MID$(a$,2)

2090 ENDWHILE
                                                                                                                                                                                 men%
320 CLOSE#file%
                                                                                                                                                                                       33Ø ENDPROC
   2090 ENDMILLE
2100 WHILERIGHT$(a$,1)=" "
2110 a$=LEPT$(a$)
2120 ENDMILLE
2130 =a$
2140 :
2150 DEF FNIn(a$)
2150 = SGN(INSTR(flag$,a$))
                                                                                                                                                                                 Listing 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10 REM >LoadMenSrc (MenuEd4)
                                                                                                                                                                                             20 REM by Tony Patterson
30 REM for Archimedes only
40 REM (c) BAU Nov 91
                                                                                                                                                                                 50 :
60 DEF PROCLOADMENSTC_Help
70 PRINTY "ARM source code for MenuEd
file loader."
     2180 DEF FNyal/ac)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {
    parameters.r[0]=4;
    parameters.r[0]=handle;
    parameters.r[1]=handle;
    parameters.r[3]=28;
    os_swi(OS_GBPB,&parameters);
    2190 DEF FAVAI(a$)
2190 LOCALD%
2200 P%=INSTR(flag$,a$)
2210 =SGN(p%)*VAL(MID$(flag$,p%+1))
                                                                                                                                                                             file loader."

80 PRINT"by Tony Patterson."'

90 PRINT"call with: A% = Memory buffer, length should be EXT#menus."

100 PRINT"

100 PRINT"

110 PRINT"

C% = pointer to sprite area, or 1 if none."'

120 END

130:
     2230 DEF FNval2(a$)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             do {
  2240 LOCALD%, d%
2240 LOCALD%, d%
2250 p%=INSTR(flag$, a$)
2260 q%=INSTR(flag$, ",",p%)
2270 IFQ%=pbp%=d%
2280 =SGN(p%)*VAL(MID$(flag$, p%+1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    parameters.r[0]=4;
/* Read menu icon block */
    parameters.r[1]=handle;
    parameters.r[3]=24;
                                                                                                                                                                                                                                                                                                                                                                          770 ANDS R0, R0, #128
780 BEQ read_option
790 SUBS number, number, #1
800 BNE loadmenu_loop
810 MOV R0, #4
820 MOV R1, handle
830 MOV R1, handle
840 SWI "XOS_GBPB"
840 SWI "XOS_GBPB"
                                                                                                                                                                                         130 :
140 DEF PROCLoadMenSrc_assem
150 DIM Q% £100
160 FORpass=0TO2STEP2
Listing 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     os_swi(OS GBPB,&parameters);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    os_swi(OS_GBPB, sparameters);
    f = (int
*) (parameters r[2]-20);
        if ( *f < -1) { *f=*(int *) }
        ((int) buffer+(*f * -4-8));;
        if (( *(int)
           10 REM >LoadMen_B (MenuEd3)
20 REM by Tony Patterson
30 REM for Archimedes only
40 REM (c) BAU Nov '91
                                                                                                                                                                                                                                                                                                                                                                         830 MOV R3,#1</br>
840 SWI "XOS_GI<br/>850 MOV PC,R14<br/>860 ]<br/>870 NEXT<br/>880 ENDPROC
                                                                                                                                                                                         170 P%=Q%
180 handle=10
                                                                                                                                                                                       180 handle=10
190 number=9
200 buffer=8
210 buffer2=7
220 sprites=6
230 [OPT pass
            60 DEF PROChelp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if ({ *(int
*)(parameters.r[2]-16) & 256)==256) {
  f=(int
*)(parameters.r[2]-12);
  if (f[1]==1)
                                                                                                                                                                                                                                                                                                                                                                 Listing 5
            70 PRINT
80 PRINT"BASIC Menu loader for BBC Ac
                                                                                                                                                                                        240 .loadmenus
                                                                                                                                                                                                                                                                                                                                                                 /C menu loader routine
/by Tony Patterson
/for Arc only
/(c) BAU Nov 91
#include "os.h"
#include "swis.h"
#include "wimp.h"
                                                                                                                                                                                       250 MOV
260 MOV
270 MOV
280 SWI
290 MOV
300 MOV
                                                                                                                                                                                                                        sprites, 2
buffer, RØ
RØ, #&40
"OS_Find"
handle, RØ
orn User !FormEd program."

90 PRINT"by Tony Patterson"'

100 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    f[1]=(int)spritearea; else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     f[0]+=(int)men;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     f[1]=(int)men:
       120 DEF PROCloadmenus(f$,b%,spritearea
                                                                                                                                                                                                                              R1, handle "OS_BGet"
       130 LOCAL menuptr%, f%, file%, num%, i%
                                                                                                                                                                                        310 SWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     while (( *(int
*)(parameters.r[2]-24) & 128) == 0);
        140 menuhand%=0
150 file%=OPENINf$
                                                                                                                                                                                         320 MOV
                                                                                                                                                                                                                              number, RØ
                                                                                                                                                                                       330 MOV
340 MOV
350 MOV
360 MOV
                                                                                                                                                                                                                                                                                                                                                                   extern void loadmenus(const char *file,int *buffer,void *spritearea)
                                                                                                                                                                                                                              RØ. #4
       150 file%=OPENINTS
160 num%=BGET #file%
170 menuptr%=men%
180 SYS &C,4,file%,b%,num%*4
190 FOR i%=0 TO num%-1
191 b%!(i%*4)+=menuptr%
                                                                                                                                                                                                                              R1, handle
R2, buffer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parameters.r[0]=4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /* Read menu
                                                                                                                                                                                                                             R3, number, LSL #2
"OS_GBPB"
                                                                                                                                                                                                                                                                                                                                                                         int handle, num, i, *men, *f;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    parameters.r[0]=4;
indirected data */
parameters.r[1]=handle;
parameters.r[3]=1<<24;
os_swi(OS_GBPB,&parameters);
                                                                                                                                                                                        370 SWI
                                                                                                                                                                                                                                                                                                                                                                         os_regset parameters;
                                                                                                                                                                                                                              R3. number. LSL #2
                                                                                                                                                                                        380 MOV
                                                                                                                                                                                       380 MOV
390 SUB
400 ADD
410 .relo
420 LDR
430 ADD
                                                                                                                                                                                                                                                                                                                                                                         /* Open file */
parameters.r[0]=0x40;
parameters.r[1]=(int)file;
         192 NEXT
                                                                                                                                                                                                                              R3. R3. #4
                                                                                                                                                                                                                          buffer2, buffer, number, LSL #2
cate_addresses
RØ, [R3, buffer]
       210 SYS &C,4,file%,menuptr%,28TO,,menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /* close file */
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parameters.r[0]=0;
parameters.r[1]=handle;
os_find(&parameters);
      tr%
220 REPEAT
230 SYS &C,4,file%,menuptr%,24TO,,menu
                                                                                                                                                                                                                                                                                                                                                                           os find(&parameters);
                                                                                                                                                                                                                                                                                                                                                                         handle=parameters.r[0];
                                                                                                                                                                                                                              RØ, RØ, buffer2
                                                                                                                                                                                       440 STR R0,[R3,buffer]
450 SUBS R3,R3,#4
460 BPL relocate_addresses
470 MOV R2,buffer2
                                                                                                                                                                                                                                                                                                                                                                         /* Get number of menus */
parameters.r[1]=handle;
os_swi(OS_BGet,&parameters);
```

# Notes

tr%
240 f%=menuptr%-20
241 IF !f%<-1 THEN !f%=b%!(!f%\*-4-8)



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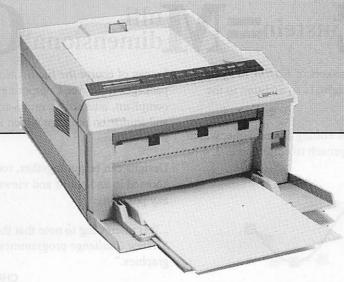
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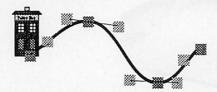
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With computers getting smaller,

# **GEOFF BAINS**

looks at a range of diminutive printers designed to help you print on the move

THE SMALL PRINT

ortable micros are rapidly increasing in popularity and of late printers have also shrunk to tiny proportions while retaining a staggering performance. However, there are still only a limited number of truly portable printers able to make the most of the output from an Archimedes. Here we look at seven of the latest models. They vary in size, weight, price and performance, but all will provide text and graphics for an Archimedes on the move.

# **CANON BJ-10e**

The BJ-10e uses bubblejet technology, giving a very high resolution of 360dpi (dots per inch). The print is deep black and even, and as such is difficult to tell from that of the best laser printers, although large areas of black can take a long time to dry and are prone to smudging.



# **BJ-10e: HIGH QUALITY**

The BJ-10e weighs under 2kg and takes up little more room than a sizeable wad of printer paper. It is nearly silent and consumes little power; a mains power supply is provided and the battery pack, which is £40 extra, is good for about 40 pages of printing.

The one drawback is its speed. In NLQ mode the BJ-10e manages a reasonable

43cps (characters per second), but the speed in draft mode the mode that saves on the ink - is exactly the same.

The BJ-10e is only compatible with the IBM Proprinter. Many of the PrinterDM driver modes will cope with this but they won't make the most of the printer's capabilities when it comes to graphics.

Push buttons enable you to select between the print modes and the three character sizes available but the selection is signalled only by hard-torecognise sequences of beeps when the button is pushed.

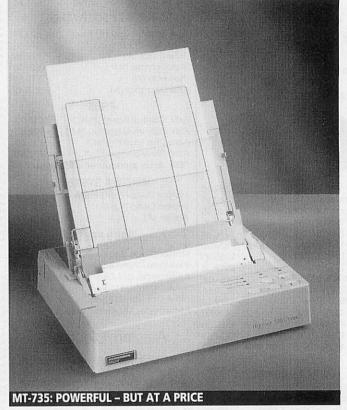
The printer can be used flat, or on its end when sheets are fed in from the base of the machine. In this position a £54 optional sheet feeder is clipped to the printer. It only holds 30 sheets, but loads them automatically. The sheet feeder is not really portable and is supposed to make the BJ-10e double as a desktop printer.

However, on the move, if fast printing is not essential, the high quality output will find the BJ-10e many friends.

# MANNESMANN TALLY MT-735

It doesn't look impressive but the MT-735 is well worth its relatively high price. It is heavy but compact, and has the same dimensions as A4 paper and is only a couple of inches high.

This thermal transfer printer has a printhead which stretches right across the paper; the ribbon is a sheet of black film which unwinds past the printhead. New ribbons are quite tricky to fit and, since the



whole width of the paper is very rarely used, they are rather wasted.

The built-in rechargeable batteries last for 80 pages of print and take about eight hours to charge up. Only cut sheet paper can be used, fed in by hand or from the 50-sheet bulk sheet feeder formed from the unfolded top panel.

Like most personal laser printers the MT-735 prints at 300 dpi. The results are almost as good, although large areas of black can be a bit dusty.

The text is printed in a range of sizes in one serif font. In HP mode there's also a choice of other proportionally-

spaced fonts. As four emulations are provided; the Epson LQ, IBM Proprinter, Hewlett-Packard Laserjet and the similar Deskjet, an Archimedes can really make the most of this printer.

Since the MT-735 is a page printer - each sheet of paper is printed in one go, once it has been 'assembled' inside the printer - it seems rather slow. But once the actual printing starts, it is speedy.

The MT-735 can produce typical text pages at the rate of about 4.5 per minute which is definitely laser printer speed. The Copy key repeats the last page as often as needed.

Although expensive, the MT-735 produces excellent print with flexibility, quality and speed approaching that of a laser printer, at two thirds of the price and in one-twentieth of the space.

# **FERROTEC H200**

The Ferrotec H200 relies on a printing module made by Toshiba for fax machines. A strip of over 1500 tiny heating elements across the page darkens special heat-sensitive fax paper.

Although the H200 is small. the separate mains transformer or £45 battery pack is external, taking up more room and weight. However, paper is stored inside the machine, saving space. Fax paper is used on a roll. It's not as neat as cut sheets but new rolls simply drop into position. It's expensive at about 4p a sheet, but the H200 is one of the cheaper machines to run since neither ink nor ribbon is needed.

The H200 can print text in two qualities roughly equivalent to the NLQ print from nine-pin and 24-pin dot-matrix printers. The lower quality draft print is dark, even and extremely legible. The NLQ print is dark and crisp, and although characters still look rather dotty the unattractive



# **FERROTEC: A BIT DOTTY**

shiny paper ensures that this printer will rarely be used for quality letters. Although two character styles are provided, these are remarkably similar.

The H200 is reasonably fast and can print an A4 page of text in about 30 seconds in NLQ mode and 20 seconds in draft mode. It is compatible with IBM's Proprinter and the less capable Epson FX codes. Because of the dark and even printing, the H200 is capable of excellent graphics, although at limited resolutions.

The H200 is yesterday's printer. Although it is fast, reasonably small and good at



printing graphics, it is capable of only reasonable print quality, uses unattractive paper and at £350 is overpriced.

# **CITIZEN PN48**

This is a truly tiny printer, and a remarkable performer. It is only 12 inches long and just a couple of inches thick and high but this small package contains a thermal printhead, and enough battery power to print 30 pages. A separate battery charger and mains supply is included

The PN48 is so small there is no room for a regular-sized interface connector and so a minature version is fitted. This requires a special, short printer lead which is supplied with the printer. Despite its size, the print quality from this machine is excellent and a thermal ribbon cassette produces text at 360dpi. Not only is the text crisp and dark but graphics images can be printed out in high quality too.

The ribbon is somewhat expensive. Two versions are available, each for £3.50. The single-strike type produces the best print but lasts for only 25 pages whereas multi-strike ribbons last for a more reasonable 100 pages.

There's no fast draft mode, only the high quality NLQ, in two rather similar fonts. However, the biggest drawback is this machine's speed of printing - the PN48 manages just 24cps, or over 90 seconds per page.

The PN48 handles only cut sheet paper and this is fed into the machine one sheet at a time. Paper is automatically fed into the machine as soon as it is introduced into the slot.

The PN48 is flexible enough. It offers Citizen's own codes, Epson LQ and IBM Proprinter, as well as partial NEC emulation for high resolution graphics. Risc OS printer drivers can produce fine quality text and graphics from this machine.

When batteries are taken into consideration, this is the smallest and lightest printer tested. Although the PN48 is not suitable where speed is paramount, the print quality and flexibility ensure that the PN48 will be much sought after by Archimedes users on the move.

# TOSHIBA **EXPRESSWRITER 201**

Like the PN48, the 201 is tiny but uses a large, optional battery pack. This bolts onto the base and lasts for 60 pages. The 201 also has no room for a standard interface socket and a different, miniature connector is used. The special lead required is included.

The print quality is not as good as the PN48's and the 201 is even slower. This model does not have automatic paper loading but it does include a paper wind knob which is just as efficient. The 201 also lacks the status display and menu system of the PN48. All set-up parameters are set with fiddly dip switches located inside the machine. Only Epson LQ compatibility is provided but Archimedes users will find that this is quite adequate.

If it wasn't for the advent of the Citizen PN48, the 201 would be heralded as a masterpiece of miniaturisation. However, it does fall behind its rival in many areas and, with the battery pack selling at £46, it costs more to boot.

# KODAK DICONIX 150+

This was one of the first truly portable printers. It is only as big as a hardback novel and it weighs a trim 1.7kg. A particularly clever space-saving feature keeps the five C-size batteries inside the paper roller. The Diconix is an inkiet printer but with just 12 ink nozzles, it gives a print quality similar to cheap nine-pin dotmatrix printers.

There are three print modes. Draft print is pretty awful and only suitable for quick rough copies. The NLQ mode is better than draft but still not suitable for letters. There is also a quality mode. This is an improvement, but the characters are still clearly made up of dots. In no mode is the Diconix a substitute for a 24pin or even a reasonable ninepin printer.

The Diconix is also not a particularly fast printer. It can manage a reasonable 96cps in



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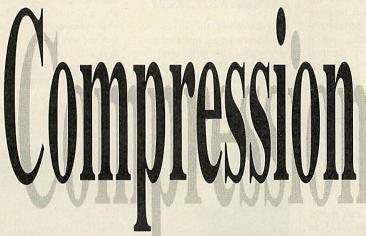
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draft mode and 21cps in quality mode, and therefore takes nearly two minutes to print a typical page of text.

Unusually, the Diconix can use fanfold paper as well as cut sheets. However, no automatic paper loading is provided and actually getting paper into the printer is a fiddly business as there is no paper wind knob. The ink reservoir includes the printhead nozzles and the whole unit is replaced when the ink runs dry, which happens after 500 pages or so.

The Diconix is compatible with IBM Proprinter and Epson FX codes. Again, this means that with an Archimedes, graphics are not up to much. However, the relatively poor quality print from this printer does not detract from the fact that it is genuinely portable and the only batteryoperated printer which can print on fanfold paper.

# SEIKOSHA LT-20

This portable printer breaks all the rules. It is an impact printer, like any desktop dotmatrix machine, but smaller. The advantage of an impact printer is that it can print multi-part forms or carbon copies while inkjet and thermal machines can't. It's also cheap to run.

However, as a dot-matrix machine, the LT-20 consumes lots of power and really requires mains. Nevertheless, a battery pack can be fitted, costing a hefty £102 extra, but



it does last for 100 pages on each charge. Paper is held in a 50-sheet tray but is rather fiddly to load.

The LT-20 can produce NLQ print in nine fonts, covering everything from plain Helvetica to fancy Script, and



LT-20 BREAKS THE RULES

the print quality is good enough for reports and letters. However, it is noisy and not particularly fast. Draft characters are produced at only 62 cps, taking around 45 seconds to print a typical page. NLQ is printed at 33 cps, which is around 90 secs per page.

Only IBM Proprinter emulation is provided, limiting its use for graphics. Manual control is also possible. However, selecting the character style requires remembering a mindboggling number of flashing light sequences.

The LT-20 is the first

attempt at a genuinely portable impact dot-matrix printer but, for portable use, it really does cost far more than its performance justifies.

# CONCLUSION

Of these seven machines, two stand-out well above the rest. For an incredible degree of true portability, combined with excellent quality print and graphics, although it is slow, the Citizen PN48 shows just what performance can be squeezed into the tiniest space.

Somewhat less portable, mainly due to its weight, but immensely capable and flexible, is the Mannesmann Tally MT-735. Although this is an expensive printer to buy and to run, it is capable of handling anything an Archimedes can throw at it, both on a desktop and on the move, and in the long run proves excellent value. The MT-735 is a truly remarkable machine.

# SUPPLIER DETAILS

Canon BJ-10e Tel: 081-773 3173 Mannesmann Tally MT-735 Tel: (0734) 788711 Ferrotec H200 Tel: (010) 3531-952529 Citizen PN48 Tel: (0895) 272621 **Toshiba Expresswriter 201** Tel: (0932) 841600 Kodak Diconix 150 Plus Tel: (0442) 61122 Seikosha LT-20 Tel: (0753) 682036

| Make and model             | Price<br>(exVAT) | Extra for battery | Claimed<br>speed Draft | NLQ  | Average speed Draft | NLQ  | Emulations               | Size<br>(wxdxh mm) | Weight | Battery life | Ink/paper<br>cost |
|----------------------------|------------------|-------------------|------------------------|------|---------------------|------|--------------------------|--------------------|--------|--------------|-------------------|
| Canon BJ-10e               | £350             | £40               | 83                     | 83   | 43                  | 43   | Pro                      | 310x217x48         | 1.8kg  | 40 pages     | 11p               |
| Citizen PN48               | £325             | <del>E</del>      | -                      | 53   | -                   | 24   | LQ, Pro,<br>NEC, Citizen | 297x90x50          | 1.2kg  | 30 pages     | 14p               |
| Ferrotec H200              | £350             | £45               | 200                    | 170  | 164                 | 119  | FX, Pro                  | 310x125x65         | 1.9kg  | 40 pages     | 4p                |
| Kodak<br>Diconix 150+      | £345             | £15               | 145                    | 29   | 96                  | 21   | FX, Pro                  | 273x165x52         | 1.7kg  | 40 pages     | 2.5p              |
| Mannesmann<br>Tally MT-735 | £749             | -                 | -                      | *250 | _                   | *188 | LQ, Pro, HP              | 287x218x60         | 3.8kg  | 80 pages     | 6.3p              |
| Seikosha LT20              | £369 ·           | £102              | 120                    | 50   | 62                  | 35   | Pro                      | 373x289x53         | 2.7kg  | 100 pages    | 2p                |
| Toshiba 201                | £325             | £46               | E has such             | 53   | 145 X 18            | 17   | LQ                       | 303x80x65          | 1.9kg  | 60 pages     | 17p               |

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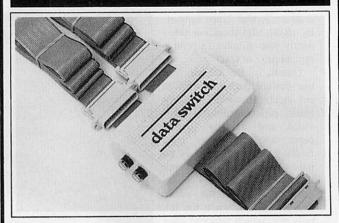


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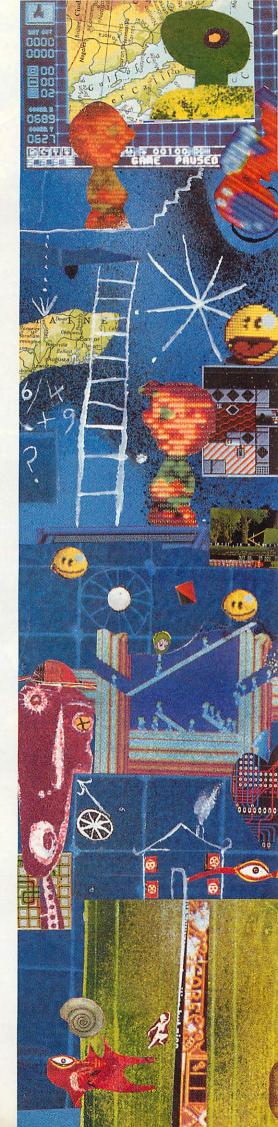
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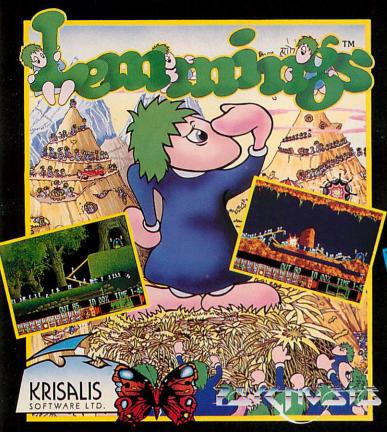
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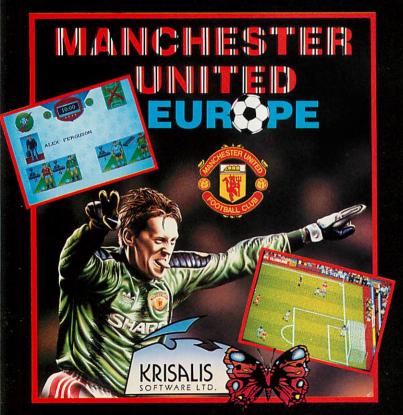
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Joining the Games All the games available for the 30 Arc - and where to get them

# THE HOUSE OF GAMES

he people who use Acorn computers fall into many a category. From the executive in the office to the teacher in the school; from the student in the college to the librarian behind the desk; and from the accountant in the city to the sorry blighter in the study who didn't use the accountant in the city; and all their children too. Yet for all their diversity the odds favour most, if not all, of these people playing computer games at one time or another, and it"s not true that the older you are the less you play. If there is one question above all that is frequently asked, by members of practically every category, it is this... which games should I buy for my Acorn computer?

The purpose of this games supplement is to answer that question. Sometimes it is asked by people who have just purchased their new machine and know nothing about the Acorn games world, other times by old hacks who want the low-down on the latest releases. No matter; the wisdom expressed in these pages is applicable to everyone who is interested in games.

The reason for producing the supplement now, four years after the Acorn Archimedes was launched, is that it is arguably only this year that good quality games are beginning to emerge.

This Christmas the tide has turned, the winds of change are upon us and someone's written a good game. Several in fact. At least ten games worthy of the machine are due to be released before Santa's deadline this year.

Part of the reason for this sudden increase is that with over 130,000 32-bit Acorn machines now in the market place, it has become viable for software companies normally specialising in computers such as the 16-bit Amiga to start devoting a bit of time to producing games for the Acorn range. Krisalis Software is the most obvious example in this respect, and it has recognised the fact that Acorn games tend to sell over a long period of time.

If an Amiga game doesn't sell 10,000 copies in the first week, then nobody really wants to know, because Amiga games only last about a month, whereas

Acorn games have an indefinite shelf life, even if the sales per week are only somewhere between 50 and 150. Publisher Clares claims that its flight simulator Interdictor 2 has sold more than 8,000 copies since its release last autumn.

The Fourth Dimension, which is probably the 'longest serving' producer of games for the 32-bit range, is now a reasonably large company with a considerable turnover. In producing mainly very good games it has managed to virtually create, and subsequently maintain, a stable games market that is ever-increasing in magnitude and importance.

The result is that there is now a fairly solid base on which to build a thriving games market. That such a base has been constructed largely during a great British economic recession is a good indicator that the future of the Acorn 32-bit range is going to be quite healthy with regard to entertainment software. And you can always catch the latest in our Game Show column – in BBC Acorn User.

Sam Greenhill

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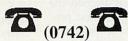
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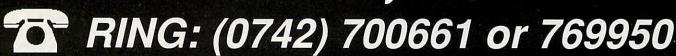


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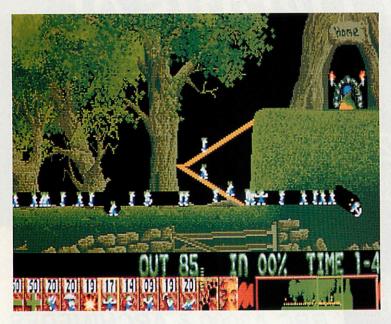






# TOP SCORE

The BBC Acorn User reviewers put their heads together for this one. By popular poll, here are the 20 most highly rated Acorn games in the cosmos - by us at least!



Lemmings Krisalis £25.99

An incredibly simple idea; a really stupid concept: mix well and you've produced the basis of many a good game. Add a few little men in blue dungarees with green hair, a few cliff tops and a large body of water and splash! There goes your first lemming. Well, you should know the game by now. There is enough information in this issue to write a thesis! But there's a plausible reason for that, one which also explains this game's instantaneous ascent to the numero uno position. It's an incredibly good game. Just why is another matter. Is it the gameplay, the sound samples or the graphics? Or does Lemmings tap into something deep, dark and sinister in the human psyche? After all, most of the fun comes from watching the cute critters being crisped, crunched and chopped up.

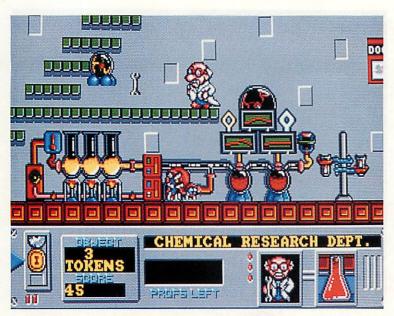
Whatever the reason, there was just no other choice for the top slot. Lemmings clocked up almost twice as many points as its nearest contender in the BAU poll, and for the normally argumentative BAU team to agree on something as easily as that there really can be little doubt - this game will waste your precious time like no other.

## **Chocks Away** The Fourth Dimension £24.95

Tally Ho Ginger! Some bally bandit just knocked us orf the top spot! Well that it certainly did, but not without a fight, or should we say flight. Chocks Away is a flying game, in which you pilot a vintage red Tiger Moth around a map blasting merry hell out of anything that moves. And rather a lot moves, particularly in the Chocks Away Extra Missions game, which costs £19.95.

In the game you take off from an airfield and fly to the target. The objective is real simple: shoot the target, avoid the flak and destroy the enemy fighter planes that are sent to intercept you. In the original Chocks Away there are three maps, one comprising land, one that is mainly sea and the other about half of each - in the sea map your airfield becomes an aircraft carrier, complete with arrester wire. The Extra Missions version has bridges, trains, barrage balloons and even a 'phantom' plane that shadows you. Possibly the best feature is the ability for two players to work together on a single mission in different planes either by linking up two machines or by splitting the screen on a single machine.





# **Mad Professor Mariarti**

Krisalis £20.53

Mad he certainly is, but the madder he will become unless he can close down his five laboratories, which are having an adverse effect on Mariarti's sanity. And no wonder, because within them lurk such beings as dancing flowers and man-eating floppy discs, not to mention vending machines that dispense blackcurrant jam and/or Virus Killer depending on the requirements of the day.

Mad Professor is a ladders 'n' platforms game in the purest form, with puzzles to be solved and new levels (laboratories) to be explored. The good professor is a jack of all trades, and his research spans the chemical, electrical, biological and, most terrifyingly of all, the computing branches of science. The experiments he conducted turned sour, and hybrid creatures formed from his results. Not being able to find anyone daft enough to take on a seven-foot dancing skeleton the prof enters the labs himself. Mad you may say, but then again: while the world relies on him, he relies on you.

Probably the best arcade adventure for the Acorn 32-bit range, although, admittedly, these are a bit thin on the ground.

**Pacmania** Domark £TBA

Pacmania is another classic arcade game, in which you control a smiley little spherical guy with a big mouth around a maze munching 'dots' and fleeing ghosts. When the original Pac Man, named Snapper on the BBC several years ago, appeared it was the most popular game available. The original was pretty straightforward. You simply moved around the maze and if you ate a power pill the ghosts turned blue and you could munch them too. With Pacmania the view has changed to three dimensions, instead of two, and Pac Man can also leap over the ghosts, adding a tricky new aspect to the original. The graphics in Pacmania are a positive point and there are four different worlds to play in, ranging from a sort of Lego-block land to a few small pyramids to a weird space-age catwalk structure.

It is the sort of game that appeals to any member of the family, so it's hard to go wrong with Pacmania, especially if you're buying it as a present. Although it is currently not available, Pacmania's new publisher has promised to re-release the game by Christmas.





# Saloon Cars

The Fourth Dimension £24.95

There are two aspects to Saloon Cars which, under one roof, could be described as the simulated adventures of a saloon car racing driver. You play the role of someone who likes to race her or his Vauxhall Astra at weekends and try to win races to support this financially burdening hobby. The game comprises both an arcade driving simulator and the more 'managerial' aspect of buying, selling and generally tweaking your car until its performance is at a peak.

This involves buying the most expensive tyres you can afford, preferably an anti-spin clutch mechanism and tweaking the gear ratios to boost the speed, plus a few other extensions. But money is the bottom line and fancy cars don't drive themselves, so the winning of races is vital. If you win enough races and cash you are offered the opportunity to ascend a class and drive a BMW M3. Drive well in this and you could end up burning Silverstone or Brands Hatch in a Sierra Cosworth.

Saloon Cars is probably the best driving game on any computer but be warned that it is quite difficult to master, even on days which started well.

# Twin World Cygnus Software £19.95

Twin World is set in a weird land far, far away, which is inhabited by many stange creatures that are best decribed as demons or wizards. The game touches on the ladders 'n' platforms formula but there are really only two platforms (hence Twin World), one above the other, and the game scrolls horizontally as you walk.

The objective in Twin World is to find all 23 parts of the magic amulet that was once owned by your now-defunct old dad. It was stolen by an evil druid and is now protected by a bunch of weirdos in a twin world! To assist you in this dubious task you are armed with a bubble gun that pelts baddies with different coloured bubbles, each one of which has its own baddie-destructive properties.

Twin World makes no great demands on the intellect, but you do need your wits about you in order to complete it, since a bubble gun can solve only so many of the problems, and you will find yourself having to study the map and its associated objects very carefully.



# The Pink Garage 0088 READY 4 0/8 0/1 Stop/In Write Zapper Pire Phisher Run/Out Delete

# **Tower of Babel**

Cygnus Software £24.95

This is the most recent game to be converted from the 16-bit world by Cygnus - you'll find it reviewed in Game Show for this issue. Babel takes you through an intense course in 3D puzzle-solving. Take charge of your three giant spider vehicles, Zapper, Pusher and Grabber, take a deep breath and you're faced with a strange landscape of sliding objects and multi-level towers.

Achieving the objective of each tower puzzle takes guile as well as determination, but the real charm of the game lies in the almost tactile sensation that the objects in the game universe give you. When you slide a huge block across the game board, you really feel it laboriously move.

This is also a game for techies. The Babel robots can be individually programmed, using a simple language. You'll need to do this often to get them to work in harmony. And finally, besides all these wonders, the game comes equipped with its own user-friendly tower designing utility, so that you too can outdo the authors and baffle your friends. Tower of Babel is a classic in the making.

# **Pipemania** Empire £24.99

It's all about flooze. Yukky, sticky, slimy flooze, and it's on the loose. Luckily the expert plumber (you!) is on hand day and night, as all plumbers heroically are, to sort the stuff out. It leaks, you pipe it, simple as that. Your score at the end of the day is based on how good a plumber you are. Naturally, the definition of 'good' stems from the ancient plumbing tradition, still avidly adopted today, of seeing how much pipe you can squeeze into a room and still claim that the system works without dripping. Hence, the more pipes the flooze gets to flooze through the more points you get.

Of course the proof of the plumbing is in the leaking, and you don't have much time to construct a water-tight path of pipes before the flooze begins to flow. As far as it is concerned a good day means just flowing on by, no gaps, straight down the pipe. But you're at the other end, desperately trying to find a piece of pipe that both fits and goes in the right direction. Such a task may sound simple, and to a large extent it is, but if the flooze begins to close, the sweat begins to roll and very soon you'll be realising what a both tricky and addictive game this is.





## MiG-29 Fulcrum Domark £40.85

MiG-29 has been dubbed Interdictor 3 by more than one person and it's a charge that is not easy to deny. Interdictor was the first flight simulator to be written for the Acorn 32-bit range and it was subsequently followed up by, unimaginatively, Interdictor 2. The basic idea in all three games is to pilot a modern jet fighter around a map and strategically reduce 'the enemy's' defences down to zilch before taking the final runway and claiming triumph.

To the untrained eyes the difference between the three games is not great, but if you really get into them, the missions in each begin to emerge as separate challenges, and of the three MiG-29 is the best. A sequel to MiG-29 has recently been released athough it is not as good as its predecessor.

A MiG-29 is of course a Soviet jet, and that slaps a new angle on the fictitious elements in the game, namely the story behind each mission - there is even one set in the Persian Gulf. The aircraft is simulated as convincingly as one can be convinced by a vehicle they've never flown, and most contemporary missile sytems are simulated in the game. Smooth and very good fun.



## Jinxter

#### Not currently available

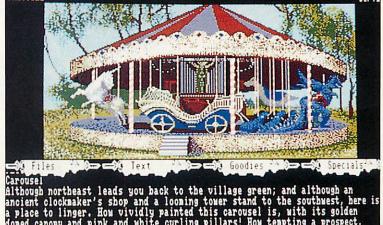
This is the first proper adventure game so far in this Top 20, being a text based game comDESCRIPTION OF THE PARTY OF THE

plimented by a few pretty pictures and a cracking plot. Jinxter was released in 1989 about six months after the previous Magnetic Scrolls adventure, also recommended. The Jinxter objective is one not unheard of before, being along the lines of 'save the world', this time from evil Green Witches who have stolen a magic bracelet and plan to use it to create chaos; such is the mentality of a witch.

Such is your mentality, you have accepted the dubious honour of this task and armed only with your brain, wit, charm and, later on, flippers, mask and wet suit, you go to it! The parser is used to interface your brainwaves on what to do, where to do it and why, with the computer and it's a very good one. This makes it possible to type in sentences containing several game instructions, all in proper English if you like, and then have them all executed correctly.

Further information about adventure games for the Acorn 32bit range can be found on the Adventures page.





ly and a furiously reasons to ride? Be daring, or leave!



# **Bug Hunter in** Space Minerva 17.95

Mr Hunter doesn't like bugs - he's a guy who just doesn't get on with the things. So you can imagine his profound disappointment one morning when he learned that his home planet was about to be attacked by little space bugs, a feeling which rapidly turned first to anger, then to business.

For Bug Hunter is his name and bug hunting is his game. And yours too, should you decide to accept this mission. OK, enough of the spiel, what's the idea? Well, instead of nuking the bugs, the Earth Federation decided to send in someone small enough to destroy the bugs' spaceship from the inside. This involves solving a few puzzles, popping the odd bug and eventually setting off a chain reaction to terminate the ship itself.

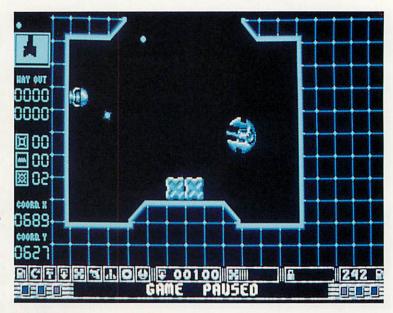
Bug Hunter is not the sort of game that makes you go 'wow' at first sight but it is cute, it has reasonable graphics and it possesses an addictive quality. If you have been with the Acorn market for a few years you will remember Repton. When Bug Hunter came out it was the nearest thing to Repton and that assessment still holds water.

# Rotor Arcana £24.99

Rotor is a space game in a very traditional sense; fly around, shoot a whole bunch of nasties and upgrade your ship. The Rotor spaceship is essentially round, it rotates, and there's a booster thingy on the back to propel you along. The game itself is set in an underground space station so a lot of delicate manoeuvring around rooms is required, and a spot of sharp shooting is not out of order from time to time.

Upgrades to your ship can include more powerful afterburners and side rocket boosters to help you rotate with greater haste! In some rooms the gravity can be quite strong so the latter here becomes a distinct advantage. There are no particular 'save the world' characteristics in Rotor, more a sort of 'save yourself' objective in fact, which is not an unreasonable target to head for if you think about it.

Rotor is basically a very simple arcade style shoot-em-up which BBC veterans have likened to the space game Thrust. Graphically it is by no means stunning, and the sound is fairly bad, but for simple addictive gameplay it definitely deserves a place in the Top 20.





## **Top Banana** Hex £25.99

Oh no like man like I just fell into this like really amazing situation man like I was standing on the ground and there were these really wild ledges stretching up above me with totally far out fruits and sweeties and acid drops lying around on them and mad waiters and chainsaws and horrible bits of litter like soft drink cans man were rolling around up there but like I didn't even get time to stand and admire this totally freaky scene man 'cos like there was all this water below my feet and it was like rising up about me and I looked up above me and I saw the Tap from Whence the Water Floweth and then I knew that I had to groove on out of there up these crazy weird platforms pausing only to quench the ravening munchies with some bites of sweeties and stuff and I found if I really like set myself to it I could like engulf the freaks that were wandering around in a like vibe of love and beauty and then they just like faded away leaving the true beautiful core of their being behind man and it was like really freaky like that was back in '91 and I haven't really got it back together since then so can you spare me some change please?

# Wonderland Virgin £35.75

Take on the persona of Alice and enter the world of Wonderland, the most recent adventure from the house of Magnetic Scrolls to enter this Top 20. This time, however, the game has caught up with the technology and runs entirely within its own windows system called Magnetic Windows. Not merely passive, the windows setup is used for moving around and performing functions such as PICK UP and **EXAMINE.** Incidentally, some earlier Magnetic Scrolls adventures have since been revised and updated to implement the Magnetic Windows feature.

In Wonderland almost every location has its own picture, sometimes with animation, and as a result the game is supplied on four discs. Everyone's favourite characters are involved in the plot and it certainly helps to have read the Reverend Charles Dodgson's classic before you begin! The puzzles featured in Wonderland are of a particularly high standard and it is definitely one of the more difficult Magnetic Scrolls games available. The only thing lacking is sound, which has not apparently been implemented in the Acorn version.



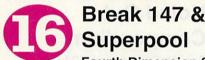
As you approach the Duchess' house, a footman in livery comes running out of the wood (you consider the footman to be a footman because he is in livery, otherwise, from his face alone, you would have called him a fish) and raps loudly at the door with his knuckles. It is opened by another footman in livery, with a round face, and large eves like a from The fish footman then produces a large envelope from under his fin



# Apocalypse The Fourth Dimension £29.95 When somebody asked the author of this

game to write a 'shoot-em-up' he followed their instructions to the letter. And we're not joking! You sit in a flying saucer armed with a yellow photon gun and traverse the planet's surface blasting the pants off anything that moves and, indeed, blasting the pants off anything that doesn't move. If you meet something that falls into neither category you might hesitate for a brief contemplation, but you'd still end up blasting the pants off it!

There are several planet surfaces whose pants need a bit of blasting and those pants are often small towns or villages, inhabited entirely by baddies no doubt. There are also rivers and boats, 'processing' pants (sorry – 'plants') and other sites on which to wreak havoc and yellow photons. Whenever you manage to annihilate something it either burns for a little while or combusts spectacularly producing a cloud of black smoke. There is probably some sort of humanitarian mission that you are supposed to be completing, but we don't know what it is and since it undoubtedly involves blasting the pants off everything, there seems little point in finding out!

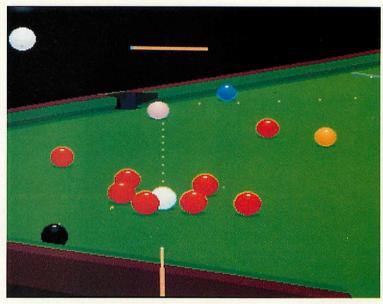


Fourth Dimension £24.95

Now this is a good game. It would probably have emerged slightly more victorious if everyone had a chance to play it before we went to press. The graphics are so good that certain photographs of the game being played could almost be mistaken for the real thing and the behaviour of balls and cue are immaculately simulated.

We set up a game with two people – one of whom is familiar with the computer and mouse but pretty useless at pool, while the other one knows his balls but has limited experience in using a mouse. The resultant contest was one that could have easily been played in the pub – the mouse expert was thoroughly and convincingly trashed.

In other words the computer appeared to neither restrict nor enhance the success of either player, but rewarded the player with true real-world skill, so this is surely a good indication that this game is about as close to the real thing as you can get without having to buy the next round.





# Zarch Superior Software £19.95

Superior Software £19.95
One of the very first games to be written for

the Acorn 32-bit computer is still regarded as a fine game on the computer today, four years after the machine's launch in 1987. That says one of two things. Either this game is very good, or the games market has been pretty damned bad. A little of both probably, though the performance of *Zarch* should not be underestimated. Now everybody knows that *Zarch* is a space game, because everybody has played *Lander* which is supplied with the Acorn equipment. The dilemma facing many punters is that 20 quid is a lot of money to fork out for a game that, despite one or two cosmetic differences, is identical to the one that they already own.

Go ahead, spend the money. Lander is fun; Zarch is a game. Zarch has a map, it has a string of bad guys and most importantly of all it has a series of challenges that develop as you play the game. And that's what gives it the quality possessed by the greatest games – something to get hooked on. Use Lander to practise on, but don't let anyone – yourself included – tell you that it is a game. It isn't. Zarch is.

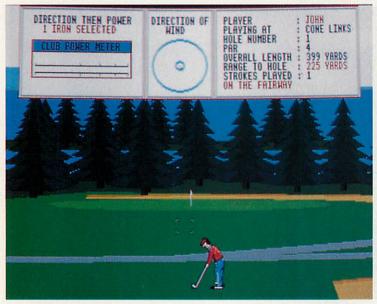
## Zelanites Micropower £24.95

Zelanites is essentially Space Invaders. Micropower doesn't like us to make that

comparison, we know, but it's like trying to persuade somebody that zebras wear pink pyjamas or trying to close the door on a sales rep! Sorry, Micropower, but Zelanites is Space Invaders and zebras don't wear pink pyjamas. But hang on, Space Invaders is even older than Zarch. Space Invaders is as old as the hills, we are talking seriously dated here. So either somebody who voted for this game is senile themselves, or this is a good game.

The plot is very clear. Aliens descend from top of screen to bottom of screen and you blow them away, before they arrive at the base of the screen where your little spaceship resides. Wave after wave of alien tries it on, and each and every one must go. Occasionally one of them drops a parachute containing a bonus extension for your craft, something that will make your task against the Martians that much easier, you know the sorts of things: a multiple missile firing system, shield or a 'freeze-ray'. Zelanites is a real old blast from the past but with fine graphics and good gameplay.







Fourth Dimension £24.95

It would be wholly incorrect to say that the sedate game of golf has not been represented by a computer game on the Acorn 32bit range. In fact it would be a gross lie because no less than four golf clones have made their way onto the format over the past few years. Of these, Holed Out has just been nominated as the original and best. Why is this? There could be several reasons. The graphics in Holed Out are interesting because, although not half as detailed as some of the game's contenders, most people actually prefer them. It's all down to aesthetics. The sound is also nicely done, and several new courses were released for the game shortly after its release.

It is probably the gameplay that makes Holed Out the most popular, since, through skill, sheer determination, or more likely pure luck, the difficulty level has somehow been set up to cater for all comers. There are two other very good golf games: Superior Golf from Superior Software and Microdrive from C.I.S., the latter of which is more of a 'simulation'.

## Terramex Krisalis £TBA

This was one of the first ever games to appear on the Acorn Archimedes, and it was written by the same team that has just brought us Lemmings, Krisalis Software. Terramex is very clearly an arcade adventure. You control one of five explorers around an underground labyrinth that is accessed via an old well, collecting and using objects along the way. The puzzles are quite straightforward and Terramex makes a good game for the middle class of adventure players - not the hardened fans. The ultimate aim is to find one Professor Eyestrain and convince him to save the world, followed - as if that were not enough - by helping him to save the world. You see, a big hole in the planet will soon develop unless an oversized asteroid can be persuaded to divert from its current course.

The graphics in Terramex are almost unrivalled, smooth and colourful with good animations. Terramex was published three years ago by a company that has since gone out of business. However, Krisalis Software has promised to re-release the title for the Acorn 32-bit range for under £20 by this Christmas, so if you haven't already got a copy, look out for this one.

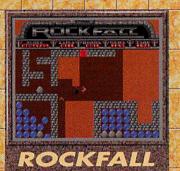












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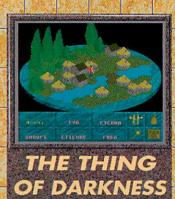












BALLARSNA: "...Game of top quality...", BBC/Acorn User; "...polished and professionnal as well as beautifully...'The micro user,"...technischer Perfektion bei der programmierungs..."ASM march 91

TAGIC: "...addictive game, containing precisely the right amount of simplicity and ingenuity to keep a player going back again & again "The Micro User;"...horribly addictive..." BAU,"...Technisch ist es ebenfalls nahezu perfekt...",ASM mai 91

BLASCON: 4 levels of fight with 256 colors,scroll,animation. "Blaston is well programmed with good graphics and sound making a profiessional looking package", The micro user July 1991

INCHACER: Take control over a fast cally buggy and race against apponents, in a land of adventures. "...a great game terribly addictive good looking and good fun", BAU august 91

BUBBBB FAIR: It all began at the fair:loky and Jinky were just having fun when the first bubble came down from the sky... 72 levels, challenges, bonus...... uses a big overscan screen(384\*264) in 256 colors.

REPEANS: A really addictive game for your ARCHIMEDES, have you the right reflex? DESKTOP compatible.

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this fantastic and first ever role playing game for the ARCHIMEDES. First create your heroes and then immerse yourself in this incredible adventure.



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# AUTHORS

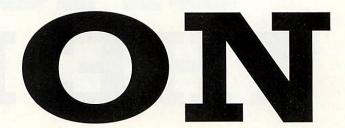
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# VENTURING

Adventure games are a highly literate form of computer entertainment. DAVE LAWRENCE looks at the delights available on the Archimedes



he world of Archimedes and A3000 adventures is a little on the small side, to say the least. Out of roughly 130 games, there are only a few adventures. Luckily, the majority of these are excellent and would keep any adventurer happy for many a long evening.

The biggest name in Archimedes adventures must surely be Magnetic Scrolls, which has released The Pawn, The Guild of Thieves, Jinxter, Corruption, Fish and, most recently, Wonderland. The company started five or six years ago with The Pawn. This was available for the ST, Amiga and PC only. The others were released at yearly intervals, again only for these machines. Corruption was the first to be converted for us Acorn users.

Since then all titles have had Archimedes versions and slowly but surely the small back catalogue of adventures has become available.

A Magnetic Scrolls adventure can be spotted at a hundred paces. Just look for the excellent packaging (normally complete with 'freebies' - there's a die with Guild, a beer mat with Pawn and a rather grubby letter with Jinxter). In Corruption the manual comes in the form of six-holed personal organiser pages. The games themselves are beautifully illustrated, normally in the form of a full screen, pulldown window. The illustrations are really just icing on the cake as the textual descriptions are often as colourful and

breathtaking as the pictures. To complete the scene, the commands can be anything from a simple GO NORTH to OPEN THE SACK. TAKE OUT AQUALUNG, GOGGLES AND FLIP-PERS AND PUT THEM ON.



THE MAD HATTER FROM WONDERLAND

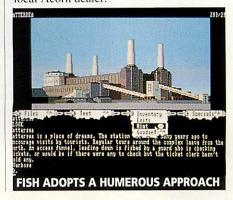
Wonderland is slightly different. Magnetic Windows, a type of desktop user interface, was developed for the game. Illustrations appear in one window, descriptions in another. The game produces a map for you as you move and you can go somewhere merely by clicking on a location. There is also an inventory window and a 'what's here' window. Picking up and dropping objects can be achieved simply by dragging them from one window to the other.

Of course, an adventure is only really as good as the imagination that went into it. Yet again, MS are practically faultless here. Pawn is a fairly standard adventure with open plains, bridges, demons, keys, snowmen and dragons. Guild of Thieves is set in the same world as Pawn and concerns your quest to join the guild Jinxter is my favourite. It has its tongue firmly in its cheek, from the moment your chair turns into Alan Whicker you know something a little weird is going on. The game is littered with countless in-jokes and references to Pawn and Guild. You must do battle with Len Wossname, ticket inspectors, the baker, the landlord and the most hideous post-mistresses!

Corruption places you in the world of high finance and unscrupulous rogues. Armed with your personal organiser, you must attempt to survive. Even at the start of the game, if you don't follow exactly the right course of action, the Serious Fraud Squad come a'knocking... I found the game a little hard to get into, especially after the frivolity of Jinxter, but it may appeal to the more hardened adventurer.

Fish, on the other hand, is back in the Jinxter camp. Humour, wit and comedy are rife in this refreshingly 'easy' game - a good one to start with. Wonderland is also relatively easy. It is based on Alice in Wonderland and, although it bears no relation to the story, all the original characters are present; the rabbit, the caterpillar, the mad hatter, the cook, the queens and more. Many of the illustrations are animated which adds a huge amount of atmosphere to the game.

The previous MS adventures have been re-coded to run under Magnetic Windows, and compilation sets of Windows adventures should soon be available from your local Acorn dealer.





# BACK 2 THE BEEB

It's undeniable that 16-bit and 32-bit games can be stunning. But, says MATHEW TIZARD, eight-bit games are often unfairly neglected

s the home computer technology marches on, it is all too easy to be dazzled by new developments and forget about the large number of excellent games available for the eight-bit Acorn range. The fact is that much of the leisure software produced for the mass market is successful solely on the basis of film tieins, or on the strength of digitised graphics. This is all well and good, but what these games tend to lack is the sheer inventiveness that BBC games software has always been known for.

Within the limitations of the machine, writers have always, by necessity, had to come up with ways of making a game enjoyable and addictive, without the benefits of megabytes of

memory and multi-coloured, hi-resolution graphics. Whether you've owned a Beeb, Master or Compact for some years, or have acquired one more recently, you should know that there is still a wealth of tremendous games software available for your machine.

To those readers unfamiliar with game jargon, there are several different recognised classes into which most releases fall. Then there is the occasional innovative program which breaks the mould and causes a lot of excitement. Here I shall be looking at some of the best BBC games still available in each category, and give you some pointers as to which games are good value for money.

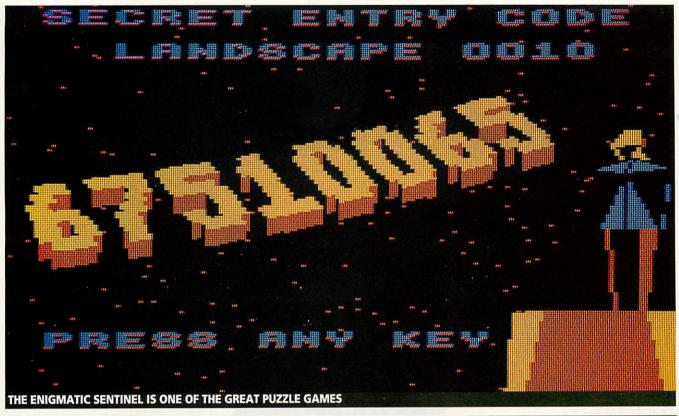
Many games have ceased to exist, simply because they originally sold out and never been remarketed. Mercifully, a new trend - that of puting several games into a single release has saved many games from being lost to the public forever.

The main exponent of this noble practice is Superior Software with its Play It Again Sam series, currently in its 15th incarnation (see our table for details). It is probably the most abundant source of vintage games around.

There are other companies still producing good games for the Beeb, notably The Fourth Dimension with titles such as Nevryon, E-Type and Holed Out, all three of which are

excellent. If there is a particular game you are looking for and it is not on any compilations, probably the best strategy is to contact one of the second hand software dealers, such as Computeck.

Some games deserve a special mention. The Repton series with the endearing lizard





digging around avoiding rocks and collecting diamonds is very popular, and Repton has become something of a cult character. Mega-games such as *Elite* and *Exile* are in a class of their own. In fact, *Elite* is one of the most successful computer games ever written and was originally programmed for the Beeb. *Exile*, on the other hand, is probably the most challenging, involving and technically impressive game ever written for the machine.

Maybe at some point in the future, a comprehensive BBC emulator will be written for the Archimedes. This would allow the entire range of eight-bit games to be seen and enjoyed by a new generation of gamers. Until then, keep on enjoying them on the eight-bit machines for which they were written.

### PLAY IT AGAIN AND AGAIN AND AGAIN, SAM

- 1 \*CITADEL(a/i) \*THRUST(b/g) STRYKER'S RUN(a/b) \*RAVENSKULL(a/g)
- 2 \*REPTON 3(a) CRAZEE RIDER(d) GALAFORCE(e) \*CODENAME DROID(a/g)
- 3 \*PALACE OF MAGIC(a) KILLER GORILLA(b) KILLER GORILLA 2(b) COMMANDO(b)
- 4 \*FRAK!(f/i) COSMIC CAMOUFLAGE(b/e) GRAND PRIX CONSTRUCTION SET(d/i) -SPELLBINDER(a/g/i)
- 5 \*IMOGEN(f/q/i) ELIXIR(a) BUG BLASTER(b) FORTRESS(b/e)
- 6 \*GALAFORCE 2(e) HUNCHBACK(b/f) HOPPER(b/g) \*THE SENTINEL(i/g/e)
- 7 \*FIRETRACK(b/e) BONE CRUNCHER(a/g) SNAPPER(b) GHOULS(b/f/g)
- 8 WINTER OLYMPIAD '88(b/c) QUEST(a/i) AROUND THE WORLD IN 40 SCREENS(a) MR WIZ(b)
- 9 CAMELOT(a) STEVE DAVIS SNOOKER(b/c) \*SPYCAT(a/e/g) THE LIFE OF REPTON(a)
- 10 \*QWAK(i/f) ZALAGA(b/e) 3D DOTTY(b/f) REPTON THRU TIME(a)
- 11 BARBARIAN(b/c/h) PIPELINE(a/g) BARON(a) MONSTERS(b/f)
- 12 THE LAST NINJA(a/f/g/h/i) SKIRMISH(b/e/f/h) BY FAIR MEANS OR FOUL(b/c/h) BLAGGER(a/f) (UPDATED)
- 13 BARBARIAN 2(b/c/h) PERCY PENGUIN(b/f/g) HYPERBALL(b) PANDEMONIUM(a/e/f)
- 14 PREDATOR(b/e) \*BALLISTIX(i/b/c) SUPERIOR SOCCER(b/c) STAR PORT(a)
- 15 \*LAST NINJA 2(a/f/g/h/i) \*CYBORG WARRIORS(b/e/g) \*RICOCHET(a/g) NETWORK(a/e/f)

#### KEY

- a Arcade adventure Move about a large setting, collecting objects and using them in different ways to solve puzzles, open doors or dispose of enemies.
- **b Arcade game** A fast-moving action game, usually military in nature, involving quick reactions ratherthan strategy and brain work
- c Sport A computer version of a recognised (or imaginary) sport.
- d Racing Cars / bikes / spacecraft. Basically just beat everyone else.
- e Shoot-em-up Annihilate as many aliens as possible. A surprisingly varied category.
- **f Ladders & platforms** Similar to (a), but the setting is usually only on one screen at a time, and there may be many progressively harder levels.
- g Strategy Requires some sort of mental effort. You will need to plan ahead or try and outwit the computer
- h Beat-em-up One or more players performing martial arts, boxing, swordfighting and so on
- i Mouldbreaker The exceptions. Usually the best games are so original, they defy classification.

  \* indicates a recommended game.

Their reputation precedes them, they are huge in scope and incredibly detailed. SAM GREENHILL and MATHEW TIZARD take a look at some big games

f the many games to be released this Christmas, three in particular stand out, not necessarily because of their impending success in financial terms but because of the sheer magnitude of work that has been put in by the developers, regarding attention to detail.

#### SECOND GENERATION ELITE

It has been seven years since Elite, the biggest selling game of all time, was launched on an unsuspecting and spellbound public. First appearing for the BBC Micro, it has only recently been converted for the Archimedes and A3000, as previewed in our September news column.

For those of you not familiar with the story of Elite (yes, pay attention, both of you), the plot runs like this; as an intergalactic space trader in command of a Cobra Mk III ship your task is to fly between solar systems and dock at various space stations, profitably dealing in different cargos as you go, in order to upgrade your ship. As you progress, you have to engage in combat with pirates, or other craft who may want to steal your cargo.

Similarly, if the mood takes you, you can turn pirate and prey on those weaker than you. Once you have become competent and wealthy enough, you are asked to undertake various missions by the Galactic Establishment, in exchange for money, equipment and status. Only the best pilots, navigators and entrepreneurs survive.

The two-man programming team, Warren Burch and Clive Gringras, have spent the last year finishing the new version of



the game. Many features, which the original game could only include in the manual as mere whimsy, have actually been added. Those original Elite fans who searched for the 40-mile long dredger or Generation ships will not be disappointed. All the graphics are solid of course, and the frame rate seldom drops below 23 per second, even with more than 100 ships on the screen, making previous 3D games look rather ineffectual and harmless.

Perhaps the most striking new feature is that the Arc version of Elite is installed on the icon bar, alongside whatever else is running. To play, you click on the icon. If you press F12 you return to the desktop, with the game paused and ready to continue. This means, of course, that you can run more than one copy of the game simultaneously. On a four megabyte machine you can play five games at once!

The other craft with which you interact are endowed with politics and motives of their own, and will intelligently seek out

their own enemies and open fire, as well as docking of their own accord. These new characteristics can lead to unexpected side-effects, for example squabbles and skirmishes breaking out in asteroid belts over who gets to mine which rocks and collect the valuable mineral fragments. If you are involved in combat, the police will help you if your legal status is clean, but will attack if you step out of line.

Galaxies are now made up of stars of different ages and colours, and planets may have a moon as well as a Coriolis Station in orbit around them.

Another major feature is that ships may fly in formations of up to 50, or 'flock' by keeping within a short distance of each other, giving the appearance of migrating birds. It is actually possible to match your speed alongside six policecraft in formation, shoot one of them with a side-laser, watch them break up, re-form behind you and blast the living daylights out of you!

Both launching and docking now have their own 3D animation sequences and the trading inside a space station is financially more realistic.

Moreover it is now mouse driven, making it and other activities more dynamic and accessible. Put simply, there is tremendous attention to detail, right down to things such as the doppler effect when another ship flies close by you.

The missions you are offered are now more involved. Often touching on moral dilemmas, and questions of mercy and humanity they no longer consist of you simply travelling to a particular planet.

Since you are supposed to play the role of the hard-bitten, cynical trader, this can often place you in some interesting psychological situations.

Clive Gringras said 'It is fitting that the greatest implementation of the world's

game has greatest been produced for the greatest personal computer in the world'.

And this sums up the situation well, because although they have made many new and exciting changes, the programmers have kept more or less to the same design brief and ethos of the 1984 version. In this sense it is more a second generation Elite than an entirely new game.

Elite on the Arc is finished, but at the time of writing the actual publication details have yet to be finalised. Visitors to the BAU show will no

doubt be traumatised by the fact that the new Elite will be there to see, but they probably won't be able to buy it!

#### KARMA

Another space game, due for partial release by Christmas, though not completely until next year, represents the fruits of eight man-years of intensive work by Rick Delarre and Ian Robinson of Periscope Software.

Karma, which will be published in sections and could eventually total seven or eight discs, has been generating rumours since a teaser advert appeared in BAU August 1989. Its authors' claim, that it takes up the idea of 3D space adventures where Elite left off, is, from what we've seen, not an unfair comment.

If you ever wondered where a passing space ship was actually going in the original Elite, the answer is nowhere. In the new Elite, the ships do have a purpose and if you follow them it will become apparent. However, in Karma this idea is taken a step further, for when a ship has docked you can follow the crew home, or to the shops or wherever they decide to go, and you will also be able to interact with them.

Until now it has been difficult to think of a space game without visualising Elite. Karma is visually similar in as much as it uses solid 3D graphics, but in Karma these are shaded in accordance with the position of light sources and also use more complicated shapes such as wings and antennae. In terms of speed, however, Karma is predicted to run at between eight and 25 frames per second, while Elite runs no slower than 23. The background story in Karma is that the universe has begun to contract and, unless humanity can be rehoused further out in the cosmos, there will be no one left to regret not having sent

RICK DELARRE AND IAN ROBINSON OF PERISCOPE SOFTWARE



you out to find a new home. It is a program of unparalleled complexity, being more akin to a true Virtual Reality lifemodel than a game.

The galaxy that you have to explore is modelled to an accuracy of 3.9 microns, and is no less than 8000 light years across. Moreover every orbit of every body in this galaxy is accurate and the entire program runs in real time. This means that if you stop playing for a week all the planets will be that much further advanced along their orbital trajectories when you resume play.

But it goes further than that. In Karma the people also live in real-time. So if you only ever play the game at nine am you'll always experience the rush-hour with people going to work. If you follow a miner, he, she or it (four sexes exist in Karma) will fly from a residential area to the mine. If you spot an ambulance you could choose to follow it and, since there is a reason for everything in Karma, you may come across an accident in space, possibly caused by a pilot having had too much to drink the night before. And if you'd followed that pilot the night before he, she or it would most likely have gone to the space-pub. It's all simulated, and that's why Karma is called a life-model.

Each time you play, the game performs a 'catch-up' cycle, in which the positions and states of all the people and objects are updated since the last time you were in the solar system. A wide variety of astronomical phenomena are faithfully modelled and include black holes, neutron stars and planets, detailed down to their atmospheres' chemical composition. So wide-ranging is the game that since the project began four year ago, both Rick and Ian have become experts in all three sciences, as well as mineralogy,

social geography, psychology, botany and a host of other disciplines.

The life-form model is so complex that it makes the space travelling aspect seem almost obsolete. As you fly around planets, ultimately trying to find a permanent settling ground for the several billion people back home, you must take life as it comes. Making friends is a good idea as somebody somewhere is bound to be able to help you.

Making friends takes many forms. You might, for example, decide to take sides in some sort of ethnic or religious conflict and you could be given the task of helping to destroy an enemy weapons station. If this is scheduled to take place a week from now, you'd have to be sure you turned up at the right time - a real week ahead.

If you are successful in your new 'life' you may find yourself progressing up the social ladder, and possibly able to converse with someone of real power, for example an ambassador or the Prime Minister, who might help your ultimate cause. The government of that civilisation could give you a job in a high place, or issue you with a passport making travel through their star systems a lot easier.

The life-form simulator works using a tree structure which keeps track of practically everything in the game. Rick explains how they created the system.

We started by defining a series of rules for everything in the galaxy. We built up lots and lots of rules, defining what should happen when a pilot drinks too much alcohol, the behaviour and natural tensions

between two civilisations that have different gravity levels and so on, until the galaxy was absolutely bursting with potential. Then, when we gave it a prod, the whole thing sprang into action, with rules for one event sparking off another event

somewhere else. The game lives on its own, whether you play it or not.

'What we're doing is so big, it's outrageous. We're lucky not to have been regarded as a couple of crackpots. We've spent four solid years on this project now, and for two years couldn't waste time or money going out for a drink or anything. We've suffered for this game!'

Good luck to them. and we hope they finish it soon. But therein lies the main difference between Karma RAY MAIDSTONE WITH HIS TALE OF ANUBUS IN THE BACKGROUND and Elite at the

moment: Elite is on the shelves as we write, Karma won't near them until Christmas, and then only in the form of a Training Mission. The full version, including the life-form simulator, will not be available until next year. However, when it does finally come out it will probably be awarded an accolade for being the largest and most innovative project undertaken in the Archimedes games world, and we're certainly looking forward to playing it!

#### TALE OF ANUBUS

If Karma is destined to collect next year's award for Greatest Project Ever Undertaken then Tale of Anubus, scheduled for a Christmas release, is this year's winner, and will probably run a close second for a long time to come. It is an Egyptian adventure being written almost entirely by Ray Maidstone who has studied Egyptology in his spare time for the past 18 years.

In Anubus you move around inside a large pyramid searching for clues which will eventually enable you to release the pharaoh who was wrongly imprisoned long before the Guildford Four were even thought of - in 2575 BC to be exact!

The clues were left by a guy called Wbnr (pronounced Weboner), Egyptian for priest, who was killed by evil spirits while attempting the same task several millennia earlier. The pyramid contains many things to be discovered, including the all-important mummies and magic potions, and sounds rather like any other normal arcade adventure.

Except that it isn't by a long way, and

for several reasons. Firstly, the graphics are in a state of absolute perfection. It is hard to imagine a game that could look better on screen. Try to imagine cruising down a corridor in a pyramid and coming across a goddess who casually walks up to





you, uttering an eerie, hollow, whispering sound, filling almost the whole screen.

She's extremely lifelike for the very good reason that the screen characters are based on real models, who found their way into the computer via broadcast-quality video equipment and colour digitisers. The winged goddess was created by filming a girl made-up to look like an ancient Egyptian, wearing a costume designed and crafted by Ray and his assistants.

Ray is a musician and used to work as an audio engineer and so the sound is also professionally recorded. In fact it is only reduced in quality when it reaches one of the two Archimedes on which the game is being developed. This attention to detail is maintained throughout. Ray's studio is full of books on pharaohs, ancient Egypt, and pyramids; a video-tape entitled Sphinx, a Walt Disney book of cartoon animations and even a cardboard cut-out of Jessica Rabbit, wife of Roger.

'The object,' Ray concluded, 'is to

make this game as realistic as possible. I want people to feel as though they are walking around a pyramid 4000 years old'. To this purpose there are no indicator bars on the screen showing things such as the state of your health. 'Instead, if you eat

something poisonous then the screen palette begins to turn green and the screen wobbles around, simulating blurred vision. Similarly, if you are wounded then the palette turns red, or yellow if you become too hungry.

'You move around using the mouse. Move it forward and you take a few steps forward, move it left or right and you sidestep, and so on. You can pick something up by holding down

the Select button, and you can even tap a stick from side to side if the lights go out. The Adjust button is useful for checking walls for secret panels'.

Real pyramids are pretty boring according to Ray. Apparently you only enter a short way in before the tour operator turns you back. The same is seemingly true of the game. You arrive at the pyramids as a tourist on a tour bus. You can wander around the area, buy an ice-cream if you want, check out the pyramids and shop for souvenirs. But there is a belief among some Egyptologists that at least one pyramid contains a secret entrance that nobody has found. As you've probably guessed, you have to find it. At this point in the game, you can drop the tourist pleasantries and get down to some real exploration.

There is a serious side to the game, one that has been picked up on by both the British Museum and the Museum of Cairo. Apart from the title screen, there is no English to be found in the game - it's genuine hieroglyphics all the way, making the game a potentially explosive educational tool. To complete the game you have to learn the ancient language of hieroglyphics as you play, though the abundance of clues means that this is not too difficult.

Tale of Anubus is currently in progress and there are doubts as to whether it will be completed in time for Christmas. Ray is adamant that it will, and he's a pretty determined sort of guy. Couple this with a bit of luck and we might be fortunate

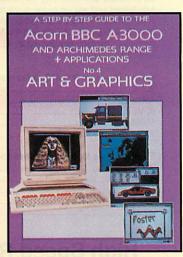
# THE FIRST INSTRUCTIONAL VIDEOS FOR THE ACORN BBC A3000 AND ARCHIMEDES SERIES

# A STEP BY STEP GUIDE TO LEARNING THE EASY WAY WITH EXPERT VISUAL TUITION









#### No.1 UP & RUNNING

This video introduces you to your Acorn A3000 computer; it will take you through connection and show you how to get **UP & RUNNING.**The Acorn A3000 is one of the Archimedes family, a powerful new breed of

The Acorn A3000 is one of the Archimedes family, a powerful new breed of microcomputer, which allows you to do more than one activity at a time (multitasking), by using windows and the RISC Operating System. It is controlled by mouse and pointer which makes it fast and easy to use and its menus are intuitive in use. It's adaptable, educational and it's FUN! If you've never used a computer before, you'll be suprised how quickly you'll take to this one.

The video will show you, amongst other things, how to load and run software, how to save to disc, how to print, how to configure your computer to suit your own needs and gives an introduction to many of the operations and activities necessary to get the best out of your A3000. It also includes a look at several of the more powerful programs from the Applications discs provided with your computer, **Edit-** a simple text editor, **Paint** - a pixel-based art graphics program and **Draw** - an object-based graphics program which will produce posters, charts etc.

No. 3 DATA HANDLING

Data Handling is the processing and presentation of information, although the introduction of microcomputers did not bring about the introduction of data handling. Whether we realise it or not, as an age-old activity, we all collect and process information for one reason or another. What the computer has done is provide easy access to, and use of, an extremely powerful means of processing data and the opportunity to spend more time analysing the meaning of the information, testing hypotheses and seeking answers to questions. This, coupled with the Acorn A3000's speed and ability to display information graphically in a professional way makes data handling an exciting proposition for the home user.

This video looks at an introductory data handling package called **DataSweet** which includes a graphics presentation application, various databases - electronic card index systems for sorting and classifying, for example, addresses, lists, record and tape collection details etc., and a simple spreadsheet - an electronic balance sheet for personal finances, banking etc. Using the RISC Operating System, data can be easily transferred between these programs and resulting graphs can be exported for use in reports produced in word processing and DeskTop Publishing programs.

For the user who may require more sophisticated software, the video looks at **Squirrel** which is a desktop database for the Acorn A3000 and **Schema** which is a RISC OS spreadsheet.

A "demo" of text, graphics, sound and animation brought together in linked pages, collectively called Multi-Media, is provided with **Genesis** and **Magpie**.

No. 2 TEXT PROCESSING

Text processing on the Acorn A3000 encompasses word processing and DeskTop Publishing. Text on a word processor is clearly adaptable. The need to rewrite whole texts to make changes is removed and writers can therefore be adventurous; using the A3000 is a means of getting all your ideas 'written' down, giving the chance to go back and polish-up spellings, grammar etc. afterwards.

global changes can be made with the word processor,

paragraphs can be re-ordered,

the printed output from a word processor is neat and professional looking,

the writer is freed from the constraints of worrying about handwriting and neatness,
 planning can be done at the word processor so that notes and lists of words etc.

can be typed in the first instance and then fleshed out into drafts later.

DeskTop Publishing is an application which produces high quality text in a variety of page formats, offers a number of different type faces and allows pictures and diagrams to be included with the text.

The Acorn A3000, through its speed and flexibility, lends itself to Text Processing, which means there is a wide variety of Text processing applications available for this microcomputer. In this film, word processing is introduced through **First Word Plus**. For the younger user, a word processor called **Phases#2** is explored which is half-way towards DeskTop Publishing. For the more serious user **Ovation Professional DTP** is examined. The **Technoscan II** handscanner is briefly introduced here and covered more fully in the Video 'Art/Graphics on the Acorn A3000'.

No. 4 ART/GRAPHICS

There is no doubt that the Acorn A3000 is a superb art/graphics computer because of its speed and ease of use and its ability to multi-task (do more than one activity at a time). The use of a computer for art allows a more flexible approach as changes can be easily made and undone at the press of a button and with the Acorn A3000 you can have a palette of 256 colours at your fingertips!

In this film handscanning is explored using the **Technoscan II** handscanner. Scanning allows pictures and drawings to be electronically copied from the printed page to be used on the computer in other applications. These images can be 'cleaned up' in **Paint** and altered in various ways by exporting them into an art package. **Revelation** is such a package where original work can be created, or prepared pictures can be processed and then used in DTP. Some packages such as **Poster**, which is looked at in the film, will allow you to create your own posters from A5 size up to A0 and will allow you to create your own special effects by bending and reshaping pictures and text before exporting them to another package like DTP. Exploit the speed and power of your Acorn A3000 with Art & Graphics!

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## Multi-Media Software

Our Genesis family of software is the best selling range of multi-media software on the Archimedes and is widely acclaimed for its power and ease of use. Genesis Plus is a new addition to the range combining many of the new features of Genesis II with the inherent simplicity of the original Genesis I.

| Genesis Plus                              | .69.95 |
|---|--------|
| Genesis Plus + Oak Recorder Sound Sampler | .95.00 |
| Upgrade Genesis 1 to Genesis Plus         | .46.95 |
| Upgrade Genesis 1 to Genesis 2            |        |
| Upgrade Genesis Plus to Genesis 2         |        |
| Genesis II                                | 130.00 |
| GenIndex                                  | .29.95 |

### **CAD Software**

As leaders in CAD software on the Archimedes, our range of CAD products have become famous for being real tools for real world jobs. Oak PCB, just released, is a powerful new desktop PCB design package, designed to be similar in operation to !Draw, with all the power to cope with anything from simple single sided boards, to complex multi-layer boards with outputs via Risc OS drivers to a wide range of printers and plotters.

| Parametric Design Tool | 359.00 |
|------------------------|--------|
| Worra CAD              |        |
| KiddiCAD               | 99.00  |
| Oak PCB                | 150.00 |
| Arcsign                | 80.00  |
| Worra Plotter          | 29.95  |

## **Econet Software**

Our expertise in networking on Archimedes is unrivalled, and we have a range of products to enable to get the most out of your network. ClassROM is a combination of software and hardware that removes the load of application serving from the network and allows machines to be remote controlled from one station. ClassPrintLD allows Computer Concepts' Laser Direct printers to be used as network printer servers.

| Disc Sharer (network licence)     | 137.50 |
|-----------------------------------|--------|
| Printer Spooler (network licence) |        |
| Econet Level 4 fileserver         |        |
| ClassPrintLD (network licence)    | 75.00  |
| ClassROM (software/hardware)      |        |

# **Programming Tools**

| Cambridge Pascal                      | 69.00 |
|---------------------------------------|-------|
| ABC version 3 BASIC compiler          | 69.00 |
| Genesis Scrint Language Book (no VAT) | 14 95 |

# Sound Sampling

The Oak Recorder sound sampler is a low cost way of getting high quality sound samples into your software. The microphone (supplied) simply plugs into the printer port of any Archimedes machine (including A3000s) and the software allows samples to be captured, edited, and transferred to a wide range of software packages. Oak Recorder integrates particularly well with Genesis Plus and Genesis 2, which have inbuilt commands to both capture and play samples from the Oak Recorder.

| Dak Recorder29.9 | 5 |
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# FUILURE FANTASIES

What lies in store for the Archimedes and A3000 games fan? JIM DAVIS takes a speculative look into the future

t's undeniably been a good year for the Archimedes, and for the Archimedes game lover. This time last year, the idea of producing a BAU games supplement would have been laughable. Now we seem to be spoilt for choice, with at least 135 games freely available.

We're doing well but, I'm afraid, we're not yet doing great. In the real world of mass market games, the Archimedes is a small fish in a big pond. Our choice of games would never satisfy an Amiga user. If you look through any Amiga games magazine, you'll probably find nigh on a thousand readily available games. There's a simple reason for this - there are around 15 times as many Amigas in this country alone as there are Archimedes - and there are virtually no Archimedes in the USA. There is also the survival of the low-priced, but admittedly sub-standard, Atari ST to be considered. Naff it may be, but it runs on a standard 16-bit processor, just like the Amiga. This makes Amiga-Atari cross- conversion highly viable, especially for fast machine-code programs.

The light at the end of the tunnel is that there are now just enough Archimedes users in the UK to justify the routine cross-conversion of 68000 games to the machine, particularly those written in a high-level language like C. We can expect a flood of such games, from Populous to Bard's Tale 2, in the coming year and they are sure to radically alter our perceptions of what constitutes a good game. The Amiga game world is highly competitive weak games go to the wall, and shelf lives can be very short. The Amiga mass market, indeed, is what drives the evolution of computer games - there just aren't enough Archimedes software houses battling it out to create the vigorous atmosphere needed.

So, can Achimedes games ever give the Amiga a run for its money? There's a lot of scope - the Archimedes is undeniably fast, and a hopeful sign will be the release of the long-awaited Karma. Solid-graphics space games have long been greeted with ennui in the Amiga world, as they repeat all the well-worn conventions established by Elite so many years ago.



Elite was the BBC micro's one great contribution to the greater games world ask any C64 owner - so perhaps Karma may be the product that upholds the honour of Acorn machines. Elite Generation 2, although an upgrade, may cause a stir in the Amiga world, too.

Don't expect too much too soon, though. Compared with a 16-bit computer, the Arm2 may be technically superior - it is a superlative number-cruncher – but the Amiga's architecture includes a custom chip, the blitter, that erodes that edge. A blitter can do fast data movement, independent of the main processor, which means that the Amiga can throw graphics around at a rate of up to 16 million pixels per second. This is what makes it ideal for flight simulators and games in general.

The ideal Archimedes game, then, would have to exploit the machine's number-crunching capacity, not just graphics. There is such a class of game, and that is the complex political or economic simulation. These range from 'god games' like Populous to more sober, realworld games like Chris Crawford's excellent Balance of Power. Such games, which can trace anything from the technological evolution of a tribal society to international relations in the cold war, may just come into their own on the Archimedes.

Which is where Karma comes in again. Apart from being a solid-graphic space game, it will also be, by all accounts, a complex simulation: a world in which many things are happening at once, on and off-screen. If Karma uses the Arc's true number-crunching power, then the poor old Amiga may not be able to handle the conversion, blitter or no blitter. We'll just have to wait and see.

I wouldn"t like to place any bets on when the first game, written for the Archimedes, will shyly takes its place in the mass market. While we're waiting, let's enjoy what we've got, and look forward to great game-playing future.



# INSIDE SILORY

To play a computer game is to peer into the mind of the programmer. SAM GREENHILL discovered the people behind the play

you've ever been hooked on a really good computer game then you'll know that the more deeply entrenched you become in play, the more obsolete the real world seems. In fact, according to Allen Marr at the University of California, Santa Cruz it has been clinically proven that the highly popular puzzle game Tetris is actually physically addictive because it also demands use of the left hand side of the brain, while most games tax only the right hand side.

People who happily allow themselves to be drawn into this trap can spend days and nights on end ogling at the screen,

and are either unaware of the social drawbacks or, if the game is that good, they simply don't care. As a result they are frequently dubbed wireheads or weirdos by the non-computing members of their families, those who are ostensibly normal!

Some play on regardless of any opinion passed on them in their absence, while those who recognise the dangers of such a label tend to sneak the odd game when they think no-one is watching.

How then do we regard the people who actually produce the games in the first place? What really goes on in the software



companies that they run? Of course the mentality of a games programmer is beyond the scope of this article or, more accurately, is beyond description altogether. Looking behind the scenes is not likely to reveal the extent to which these people may or may not be weird. Nonetheless, the philosophy of certain software houses can say a great deal about the programs they produce.

If you are new to the Archimedes games world, then Krisalis Software and The Fourth Dimension are two names you will soon come to know well. If you are not so new to this world, then you will already know that I am talking about two major software houses for the Archimedes. But how well do you really know them?

#### TWO OF A KIND

The Fourth Dimension should have at least eight new games out between now and Christmas, and is the biggest software house in the world of Archimedes games. Hot on its heels, however, is Krisalis Software. The company only began publishing games a year ago, but is now beginning to make serious in-roads into the

32-bit scene, with popular programs such as Lemmings.

The two software houses could scarcely be more different. Games produced for the Archimedes and A3000 range by The Fourth Dimension will probably never see the light of day on another computer. In contrast, when Krisalis produces a game for the same market you can usually walk into a high street games outlet and pick up copies of the same title for the Amiga, Atari ST, PC and even the Spectrum.

The Fourth Dimension outfit, run by brothers Steve and Mark Botterill, started two years ago in someone's front room. Now it occupies several sizable offices, mostly stacked full of games, in the city of Sheffield. 'Each time one of our neighbours goes bust we simply take over their office,' explained mild-mannered Steve.

Its offices are entirely given over to the business of administration; there is no software development going on there and the onus is on two people, Rick Sutcliffe and Simon Longley, to keep things running smoothly. In the meantime, the 25 programmers, of whom 15 are currently active, work from home on equipment provided by the company.

As well as the 18 or so Archimedes and A3000s in its arsenal, The Fourth Dimension also owns three video cameras, eight sound samplers and 'more copies of the art package *Atelier* than Minerva'.

As project director, Mark keeps in touch with the programmers, while Steve's job as financial sirector is to prevent Mark spending '£16 billion on the game that's going to save the world', which he has tried to do from time to time

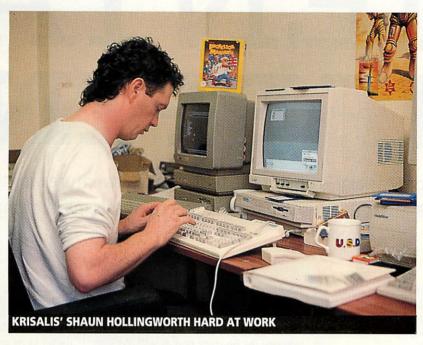
Krisalis takes a different approach. There is only one front room, and that's the reception area. Virtually all games are produced by programmers working inhouse, with the obvious advantage that all resources are situated under one roof.

The company is run by three people; Tony Kavanagh, who keeps the books balanced, and Shaun Hollingworth and Peter Harrap who direct the development aspects. Games are created by a whole team of people – Krisalis employs six full time programmers who are assisted by five full time computer graphics artists and one musician. Either the artists are very bad or the musician is very good – I'm assured that the latter is, in fact, the case.

The question is, why does Krisalis find it profitable to convert 16-bit titles when other software houses claim otherwise?

#### **CONVERSION CASE**

Shaun explained: 'It's because we can do them quickly and easily. With *Mad Professor Mariarti* Tony said to me that if I didn't convert it before the end of the week he didn't want it. So I did. We've



also had experience with the Acorn machine because we coded *Pacmania* and *Terramex* on it four years ago. Other houses have no real experience and so they don't want to commit any programmers.'

Said Tony, 'We wanted to build up a portfolio of Acorn games so that it would become cost effective to advertise. So instead of just converting some of our own titles we decided to go out and head-hunt some of the best 16-bit games, and that's where *Lemmings* came from.

'We approached many other companies producing games for the Amiga and Atari ST and offered them a deal. We would convert and sell their games in the 32-bit format and pay them a royalty for each copy that we sold.'

This strategy appears to be working with gusto. Eight 16-bit software houses have now sold Krisalis the rights to convert their titles, putting the company in a very powerful position. And so, the future looks rosy, but will the Krisalis monopoly reign forever? Shaun said: 'The worrying thing for us is that if we are too successful other companies might decide to convert their games themselves. From the players' point of view, of course, that would be very good, but it would mean that we wouldn't have the same scope of products that we have now.'

The Fourth Dimension on the other hand, has never been interested in converting games. As Mark explained: 'All our games are written because the programmers who write them *want* to write them. It has to be programmer-motivated

otherwise our system would fall down.

'An author has a great idea for a game and goes away and writes it. We often don't see anything until it's almost finished. The reason our games are of high quality is because each is written by someone who is absolutely dedicated to that particular game. It's their baby.'

# THE 'WRITE' APPROACH

Author Gordon Key is a pool enthusiast whose current baby is the game *Break 147 & Superpool* (see the Top Score feature for

more information about this program).

'Gordon did most of the work himself, although we helped him by playing pool in the pub and stealing the rules out of the case on the wall'.

The Fourth Dimension is clear about the sort of people who play its games. Steve sees them as people 'who want to see their machine stretched. They've paid good money for the best machine and they don't just want conversions. They're the sort of people who like to have fun.

'They take the game home and play it all night; they're the ones who like a bit of fun and a bit of humour rather than everything perfect.

'Chocks Away is not a flight simulator; it is a whacky game. The person who likes a modern jet simulator that is aerodynamically correct to the nearest nut and bolt is often the business person in the offices who likes something that's a bit flash

'We always try and put something in our games for the player to discover. In Saloon Cars you can hoot the horn if you press the right button, and that's not in the manual. We just want people to be sitting there one day when they find the key and suddenly the horn sounds!

'In *Apocalypse*, author Gordon Key tried to create a sound sample that sounded just like the last Prime Minister.

'Whenever he speaks in a high pitched voice, he sounds like Margaret Thatcher. Maybe we all do...,' Mark reflected.

I don't know, maybe these people are weird! But at least you now know who they really are.



# MENTAI MAPPING

Mad Professor Mariarti is one of the best arcade adventures for the Archimedes. ROB MILLER helps you to make sense of this maze of madness

very so often, in the games world, a real 'classic-of-its-kind' appears and if you enjoy platform 'n' ladders games, you will probably already know about the Mad Professor Mariarti.

Your task in this classic game is to guide the professor around a series of laboratories and close each one down in turn. Unfortunately, the results of the professor's experiments are roaming around - revolting creatures who have no desire to be entrapped.

By solving a number of puzzles in each room, you can finally progress to the challenge of closing down a nuclear reactor and saving the day. Any game of this type can appear complicated; especially with the large area to explore in each laboratory. What's really needed is some kind of map for each level and, as if by magic, there are two in this feature. These should get you started, and may even get you past the finishing post as well. As long as you remember a few basic rules, you should be able to finish the game without resorting to the built-in cheat.

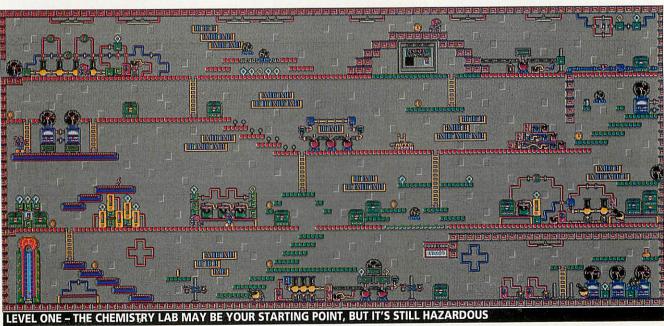
#### **GENERAL TIPS**

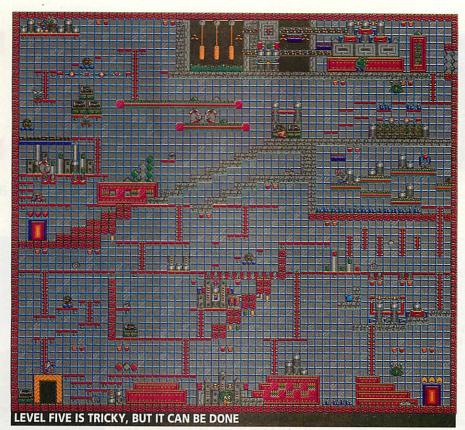
There are five levels, or laboratories, to visit in order to finish the game; four of them must be completed before moving on to the last one. There is no particular order in which the first four rooms should be entered, but I would recommend starting with the Chemistry Lab first, followed by the Physics Lab, Astronomy Lab and penultimately, the Botanical Lab.

The first rule to remember is this, if it moves, shoot it! In order to make the later levels easier, including the final room, it is useful to be armed with the best available weapon. The least nasty of the nasties can be dealt with using the spanner (the professor's default weapon). And, with a squirt of the lethal Virus Killer, the nastiest nasty will expire in a cloud of smoke.

Weapons are paid for with tokens which can be found around each room. The better the weapon, the more tokens required. The Virus Killer (the best weapon) costs 30 tokens which will require visits to at least three rooms.

The next tip is, look before you leap. The professor has four lives, he can lose a





life rather swiftly by coming into contact with too many nasties. For instance you might climb up a ladder, directly

into the path of a wandering cabbage. Other hazards to look out for are items of dangerous machinery. It's not a good idea, for instance, to step on anything resembling loose wire, bubbling liquids or other dangerous objects. Each level contains a switch that will, when it is turned off, go some distance towards stabilising the hazardous hardware. Find this switch first if you can. You won't be able to complete the level without doing so in each room.

#### STARTING OUT

The Chemistry Lab, or level one, contains plenty of problems to solve and nasties to shoot, and it is good place to get some practise in, before moving deeper into the game. There are a number of things you can do and the following steps should guide you through this level. Of course, you can refer to the map if you get lost.

Don't forget, there is no time limit, although the professor may get a little impatient if left waiting around, so as long as you are out of reach of a nasty, you can take your time to get in the right position for a tricky jump or manoeuvre.

It is assumed throughout the following set of instructions that you are familiar with the controls of Mad Professor Mariarti and know how to select objects and so on. Note that in order to use an object, you must be holding it and make sure you pick up any tokens on the way.

The route you choose between the steps is not really important and there is usually an obvious way to go. So, once you are in the Chemistry Lab, try out the following:

- Go all the way to the left of the room and flick the switch.
- Go up to the third floor on the far right and collect the jar.
- Go up and left to the top left of the room and collect the strength potion.
- Go down and get the token. Walk right off the platform and drop down on to the conveyor belt to collect the handle.
- Go up to the the Auto Ladder and fix the handle to it. Wind it up and go up the ladder to collect the second jar.
- Go down to the locked door at the bottom right of the room and use jam jars to 'see' the door entry code. Walk to the right and the door will open. Go to the far right and collect the mallet.
- Go across to the far left and hit the 'Test Your Strength' machine with the mallet. As long as you have the strength potion (see above), the bell should ring and you will then be awarded with an oil can. Collect the oil can.
- Go to the top right of the room and oil the water valve. The water will shoot up, lifting you to the switch above. This, in turn, will close the room down.

That should be enough to keep you busy for a while. When you can complete room one, have a go at the other three - you will have to do these in the right order. Rather than give a complete solution for each, this time we left all the problem solving to you. Don't forget that this game is not called

Mad Professor Mariarti for nothing. All of the objects have a use and some will need to be used together.

When you get to the last room, you're on the home run. Level five can be quite tricky but it is not impossible. Dexterity is the keyword here, especially when jumping between ladders. Of course, having just finished the four previous levels, this should really be no problem.

- Start off by climbing up, walking right and dropping down on to the ledge to collect a pair of shoes.
- Walk right and turn off the switch.
- Go down to the floor, walk to the bottom left of the screen and go up to get a bottle of port. You will notice that to complete steps one to five you need to drop to the floor and climb up the left side of the room.
- Go down and round and get a mirror.
- Go down and round and get the television. Be careful when jumping between separate ladders.
- Go down to the bottom right of the room to the teleport. Use the television and the bottle of port to activate the teleport (Teleport! Geddit!?)
- Go up (using bouncy shoes on springs) to the top left of the room.
- Go right, down and left along the conveyor belts and drop on to the ledge to collect the atomic mask.
- Go to the top right of the room and show the mutant a mirror to scare him off.
- Put on the atomic mask and go in to the reactor and shut it down with a switch.

You should now be looking at the special end message. Take a pat on the back, sit down and think how easy it all was.





Think you know all about the life of a lemming? If so, you

#### **Ouestion 1**

Of the following theories, which four are thought to be possible reasons for mass lemming migration.

- □ Suicidal tendencies
- ☐ Seasonal habitat requirements
- ☐ The alcohol laws in Norway
- ☐ Food shortage
- ☐ Boredom
- ☐ Claustrophobia
- ☐ Lunar tidal cycle
- ☐ Overpopulation
- ☐ Going home to Atlantis
- ☐ Magnetic north interference

#### **Ouestion 2**

Lemming population explosions occur with measurable regularity. Which one of the answers below best describes the frequency of such explosions?

- ☐ Four times a year
- ☐ Twice a year
- ☐ At sunspot maxima
- ☐ Once every four years
- ☐ Every nine months
- ☐ When the Northern Lights shine

#### **Ouestion 3**

When lemmings migrate, roughly how far do they normally travel in one day?

- ☐ 1 mile
- ☐ 5-6 miles
- ☐ 1500-2000 Lemming Strides
- ☐ Until they reach the sea or collapse exhausted trying

#### Question 4

Why do lemmings enter water?

- ☐ To cool down
- ☐ To get to the other side
- ☐ To exercise
- ☐ They mistake it for vodka
- ☐ To drown
- ☐ Because lemmings are always born under the sign of Aquarius

Send your answers with a tie-breaker caption to Lemmings, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ

#### LEMMINGS COMPETITION

You could win a weekend trip for two to Bergen, in Norway, the country where the infamous lemmings can be found - stars of the latest game from Krisalis. The beautiful city of Bergen sits in the crook between the mountains and the sea and is a fascinating mixture of old and new.

The lucky winners will fly out from the nearest airport of their choice and spent three days and two nights in the nations's glorious fjord country, all courtesy of Acorn Computers Ltd. Krisalis Software has donated ten copies of Lemmings for the Acorn 32-bit range to be given out to the ten runners up.

All you have to do to win a prize is correctly answer the four questions on the left and complete the tie-breaker. Our learned lemming expert has prepared a few words below as an introduction to the real lemming, but don't be surprised if you end up delving into an encyclopaedia: we haven't given away much!

#### NORWAY LEMMING

Lemmings are small furry rodents that eat grass and have large families. The Norway Lemming lives in the cold Scandinavian hills and is the species of lemming that is famed for its apparent tendency to commit suicide en masse. Except that it doesn't.

Lemmings do not voluntarily die. It happens when the lemmings decide to move home, to migrate to another place. Several thousand lemmings pack up and leave, and they head down the hills towards the water.

Researchers - those brave souls who camp out in the cold Scandinavian hills, to watch the little rodents - still do not know exactly what causes a mass migration. It usually occurs following a 'population explosion', when lemming mothers can give birth to up to 50 babies.

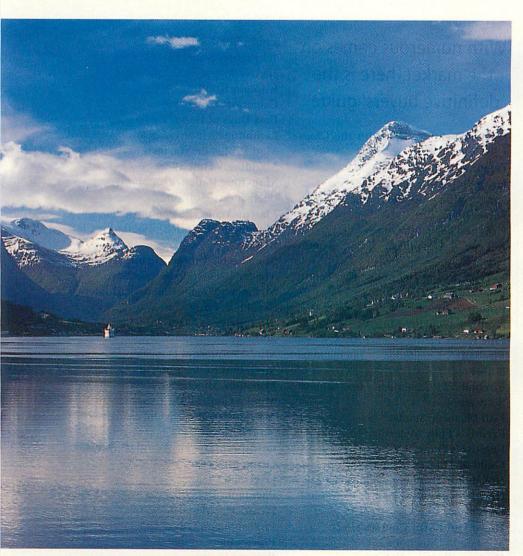
The ensuing exodus is very disorganised. Usually there is such a frenzy that the lemmings swarm towards the water in a large pack, often damaging the local wildlife on the way.





# A TRIP TO NORWAY'S FJORD COUNTRY

could win yourself a weekend in the scenic setting of Norway's fjord country



## TIE BREAKER

The cartoon shows one of our foolish little lemming friends, on his way down to the watery depths. What we want you to do is look at the picture and put yourself into a lemming's shoes. What would you say while hanging precariously from a cliff? Fill in the speech bubble with the wittiest comment you can think of, to complete the tie-breaker.

## Rules of participation

- 1. No purchase necessary.
- 2. Instructions form part of the rules.
- 3. Responses will be deemed to be correct only when the items ticked correspond exactly to those on the official answer sheet held by the editor.
- 4. Participants may not be direct employees of Redwood Publishing, Acorn Computers Ltd, BBC Enterprises, or their nominated representatives, agents, or connected with the administration in any way.
- 5. Closing date for competition entry is 1 December 1991. The first eleven entries drawn out will win prizes as stated above, in descending order.
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LLUSTRATION BY GARY WINC

# WHO'S WHO INGAINES

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ALPS System Alpine Software
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Blitz Arxe

**Blowpipe** Eclipse

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**Bouncer RTFM** 

Break 147 & Superpool

The Fourth Dimension

**Bubble Fair Eterna** 

Bug Hunter Minerva

**Bug Hunter in Space Minerva** 

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Chocks Away The Fourth Dimension

**Chocks Away Extra Missions** 

The Fourth Dimension

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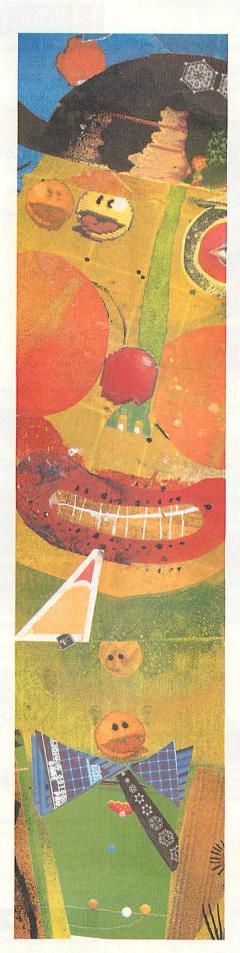
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Arcana Available from Acorn dealers Arxe Games PO Box 898, London E7 9HJ Tel: 081-534 1198

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Empire Software Unit 4, The Stannetts, Laidon North Trade Centre, Basildon, Essex, SS15 6DJ Tel: (0268) 541126

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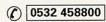
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# SCREENTEST

The A3000 is playing a major role in a new BBC television series. DAVID WATKINS takes you behind the scenes to see how it was used

xplaining about fundamental mathematical software to a class of seven to nineyear-olds is now the subject of a new television series. It's called Mathscope and the 10 programmes aim to support children working at levels two to four of Key Stage 2. The programmes aim to consolidate their current work and provide mathematical adventures to further their understanding of the subject. The underlying theme reflects the use and application of mathematics as seen in everyday life.

#### FORWARD PLANNING

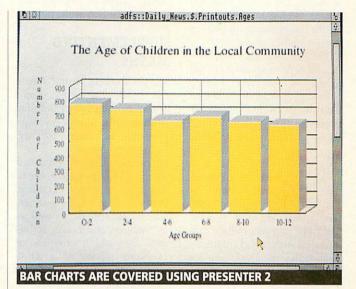
At present, the most common primary school computer is the Master 128, but there are still many model B machines in use and the A3000 is increasingly used in primary schools. This created a immediate dilemna for the production team, who had to decide whether to use the familiar BBC Master 128, or the newer A3000, to demonstrate the technology available. They also had to take another point in to account - the fact that the series would probably have a transmission lifetime of about

four years, which could be extended by up to two years, with the use of video recorders in schools

The A3000 had two obvious advantages. It provides a superior output for television viewing, and in educational terms the Wimp interface of Risc OS is relatively easy for children to master. These considerations, together with the expected lifetime of the series and the increasing use of the machine in schools, led to the A3000 being chosen as the computer used in the series.

When the series was still in its planning stage the producer, Julia Drum, explored the possibility of using currently available software. The production schedule and budget restrictions meant that it would be impossible to commission software for the series and as BBC Education Officer, I had access to all BBC Soft titles these are programs originally produced by BBC Enterprises and now published under licence by Longman Logotron.

However, I had no money to buy other software and I was relying on software publishers to provide us with copies of



their programs. As the outline of the series began to take shape, I looked for opportunities to include relevant use of the A3000 and telephoned a number of software publishers to see if they could help.

I wanted to show adventure programs, a bar code reader, Logo, databases, spreadsheets, wordprocessing, desktop publishing, drawing and painting packages. I also wanted some specific maths programmes, such as Maths With a Story. The decision to use available software in the series, rather than specially commissioned material, means that teachers can use the same packages in the classroom during their follow-up activities.

It was decided that each programme should consist of four linked sections: an on-going drama featuring children using maths, an animation highlighting mathematical concepts, a documentary showing how maths is used in ordinary situations and a studio-based presenter to provide continuity and link the other sections of the programme together.

Neither the animations, which feature a piece of string called O'Liney, nor the documentaries offer any opportunity to use the A3000, but the studio and drama sections do.

#### **ACTION REPLAY**

The adventure is set in Babbage Park Adventure Playground and focuses on the activities of four children. An A3000 and a Deskjet Plus printer is located in the playground offices and used by the children, in particular Darren, who is responsible for producing a regular newsletter with Acorn Desktop Publisher.

The instructions for a Mathstrail are produced in the first episode using PenDown 2 and the Save Our Playground posters are produced in the last two episodes when the park is threatened with closure. Page



layout and poster design both involve require measuring and spatial awareness skills and these are re-inforced throughout the series.

Draw was used to create local street maps and a set of road signs - these were later used to create a database with Genesis. As part of programme three, the wrong map is sent to the photographer and as a result he gets lost. Omar prints out the correct map and Darren is able to guide Barry to the playground, thanks to Barry's mobile phone.

The children carry out traffic surveys and display the results as bar charts using Presenter 2. A report produced with Acorn Desktop Publisher is presented to the local council in an attempt to persuade them to change their plans for the park.

When Babbage Park Adventure Playground holds its Summer Fair in episode eight, the A3000 is used on the Tombola stall to generate random numbers. I had originally intended to use Numerator for this task but was asked to provide something more colourful. Unable to find an acceptable commercial package, I wrote one myself and this is the only time in the series that non-commercial software is used.

I used FontFX for the logo, captured the numbers from Edit as sprite files using Paint, and borrowed two sound samples from Armadeus. A short Basic program of about 40 lines displays the logo, plots colourful circles and rectanselects numbers at random and plays a fanfare as the numbers come up. All this took less than two hours work, from start to finish.

With the exception of the last two programmes, the drama sections are complete in themselves. This means that teachers can choose to show the programmes of relevance to their own curriculum, without the pupils feeling that they have missed part of the plot.

#### SUPPLEMENTING MATHS

Martin Roberts, from That's Life and The 8.15 From Manchester, is responsible for producing the Mathscope Supplement, an insert for the Local Daily News.

The supplement, produced on an A3000 using the Acorn Desktop Publisher, contains items such as maths puzzles, teasers and recipes, as well as information and maths activities. As such, it provides an excellent model of a class newspaper that teachers might like to use as a basis for follow-up work.

A typical example of a puzzle appears in the seventh programme where children have to convert the time on an analogue clock to the 24-hour format. The clock faces were created with Draw and the gridlock option enabled the numerals to be positioned accurately. The clock hands are just thick lines with triangular end caps. The faces

adfs::Daily\_Heus.\$.Street\_Hap The Glebe . Oak Street Imperial Road Nelson Avenue Lea Close Green Lane Gatcombe Road Bull Yard Mays Lane Falcon Road Victoria Avenue Gladstone Drive Crosby Gardens Yerbury Road High Street STREET MAPS WERE MADE USING THE DRAW APPLICATION

were imported into Acorn Desktop Publisher and clues were added to help the children distinguish between am and pm.

Using a local street map, Martin investigates designing a new delivery route. He realises that if he puts barriers across some of the roads on the map, he can create a maze puzzle for the supplement. The addition of a compass to the map enables the solution to be given with detailed directions.

The combination of Draw and Acorn Desktop Publisher is used in the fifth programme to produce instructions on how to assemble a die for publication in the Mathscope Supplement. The framework of a cube is drawn, complete with tabs plus solid lines to cut along and dotted lines to fold along. Assembly instructions are then added to the page. Observant viewers may notice how Martin interprets the instruction to 'score along the dotted lines with a ruler'.

The links between the sections of each programme mathematical enable the concepts to be reinforced. For example, in episode nine where the children decide to carry out a survey to try to save the playground, the documentary section shows the building of the Dartford Bridge and comments from local residents, while in the studio Martin shows how a relevant questionnaire might be constructed.

He later collates the results of a reader survey about the Mathscope Supplement and presents his findings as a bar

chart using Presenter 2. As the input screen of Presenter 2 would not have been readable on-screen in a classroom situation, it was necessary to use a DTP screen with 72 point text for the inputting of data.

#### CONCLUSION

Mathscope is not focused around the A3000, nor does the computer do anything spectacular in the series. It is simply shown as an appropriate tool to use in a variety of situations, by children and adults alike.

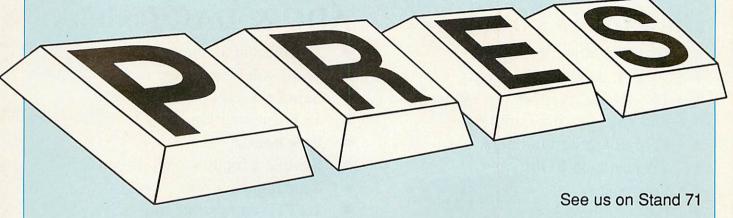
In National Curriculum IT terms, the series supports Information Handling, Communicating Information and Applications and Effects at Key Stage 2. Even if teachers do not have access to an Archimedes computer, the principles of word processing, desktop publishing, data handling and graphical display are explained. Since they are actually seen in action, the principles can be clearly understood by children.

To help teachers plan their response to the series, Acorn Computers has published an information sheet describing all the software used in the together with the series. names, addresses and telephone numbers of all the suppliers. It is available by writing to Mathscope Information, Sales and Marketing Service, Acorn Computers, Fulbourne Road, Cherry Hinton, Cambridge CB1 4JN.

The Mathscope series is shown on Monday mornings, at 10am on BBC2, until 11 November 1991.



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### CHARACTER REFERENCE

**GRAHAM BELL** examines the wealth of options open to the font fancier

hile the Archimedes does not have the range of typefaces boasted by, say, the Macintosh, the fonts available are of high quality and cover almost all needs. Fonts can be obtained from a number of diffferent places and can make your documents far more visually appealing.

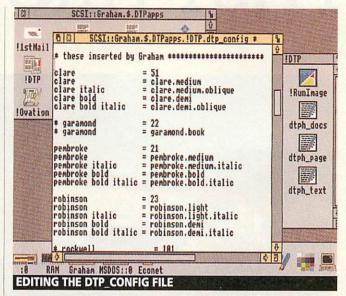
A number of public domain (PD) libraries offer selections additional typefaces. Although this is a cheap way of obtaining extra fonts, most of them are not as well drawn as the commercial offerings they do not have a complete character set and they are almost always unhinted. Some are, in fact, illegally converted versions of Macintosh fonts a common tell-tale sign of this is a flowing f character at character 132 or 135 (type 132 or 135 on the numeric keypad while holding down ALT to get these characters).

#### ADDING FONTS

If you have purchased an extra font for your Archimedes, it is usually supplied as a folder containing two files called Outlines and IntMetrics.

A family of fonts has several of these files arranged in sub-folders like Bold and Oblique. To add the new fonts, hold down SHIFT and doubleclick on your main Fonts folder to open it. You will see several sub-folders corresponding to your existing fonts. Drag the new font folder into the window, then doubleclick on the main Fonts folder again. The new font will be included in the font list alongside all of your old fonts, and it can be used by any applications loaded afterwards.

This is all you need to do if you have a non-Postscript printer, whether it is dotmatrix, ink-jet or Laserjet. Postscript printers require an extra step because they don't understand the modified Acorn



font names - for instance, Times becomes Trinity on the Acorn. Hold down SHIFT and double-click on the PrinterPS printer driver and drag PSprolog into Edit. Make sure that this is not your only copy of the PSProlog file.

The PSprolog file controls the linking of RiscOS fonts to their Postscript equivalents, and for any new font, there are two places in the prologue to add new links.

The first is at the beginning, after '%%DocumentFonts:' - you add any new Postscript names you intend to use. Then at the end of the file, a line like the existing ones must be added, containing both the Acorn and

Postscript names. For a whole family of typefaces, you need a line for each one. Follow the style of the existing fonts, and be extra careful as you type Postscript font names - the spelling and punctuation must be exact and the names are case-sensitive

Some typefaces, particularly those from Electronic Font Foundry, contain characters in addition to those used by Acorn. In this case, the font comes with a new version of PSprolog as the changes necessary are more extensive. In this case, replace your version with the new, but remember, if you added any 'simple' fonts beforehand, add them

again to the replacement PSprolog file.

If you use Acorn DTP, then any new font added needs to be recorded in a further file. The DTP\_config file links Acorn font names to the range of text styles used by Archimedes DTP.

To edit DTP\_ config, press SHIFT and double click on the ADTP icon to open the application folder. Then drag the configuration file into Edit. DTP\_config needs lines added to it, one for the whole typeface family and one for each weight in the family.

Again follow the existing style. The numbers for each family are font numbers used by Xerox's Ventura Publisherer. In fact, you can use any number for each family, but your text might change if you transfer it to another machine with different font numbers used in its DTP\_config file. A table of the correct numbers is shown below.

#### **ERRORS**

It is possible that adding fonts to your system will cause a number of errors to occur. Many early Archimedes programs cannot cope with the number of fonts you can now add. Edit, for example, crashes with an error type 5 if you install more than about 25 The simplest way around this is to add the line 'Set FontSPrefix "" just before the Run statement in its Run file.

This limits Edit to working in the system font. You must click on the main Fonts folder again after loading Edit like this. Draw doesn't crash, but won't show more than about 60 fonts correctly on its menu, or won't properly select fonts near the end of the list.

And if you are still baffled by the jargon, take a look at our feature, the A-Z of Fonts, on page 62. The rest should be plain sailing!

| POSTSCRIPT       | ACORN       | BEEBUG   | EFF        | FONT NO |
|------------------|-------------|----------|------------|---------|
| AvantGarde       | THE STATE   | Vogue    | EFF AQ     | 51      |
| Bookman          |             | Bookmark | Book       | 23      |
| Courier          | Corpus      | Curator  | Evenwriter | 1       |
| ZapfDingbats     | Selwyn      |          | Dingbats   | 129     |
| FranklinGothic   | ALCOHOLD VI |          | Franklin   | 56/57   |
| Helvetica        | Homerton    | SwissB   | Swiss      | 2       |
| NewCenturySchlbk | NewHall     | I STATES | NewSchBook | 20      |
| Optima           |             |          | Oxford     | 52      |
| Palatino         |             | Paladin  | Michael    | 21      |
| Symbol           | Sidney      | SymbolB  |            | 128     |
| Times            | Trinity     |          | EFF_Times  | 14      |
| Univers          |             | TOE WIND | English    | 91/93   |
| ZapfChancery     |             | Chaucer  | Chance     | 29      |

# RAYERS OF THE FAST ARC

Ray tracing can produce some stunning graphics. **ROB MILLER** 

looks at a new user-friendly program

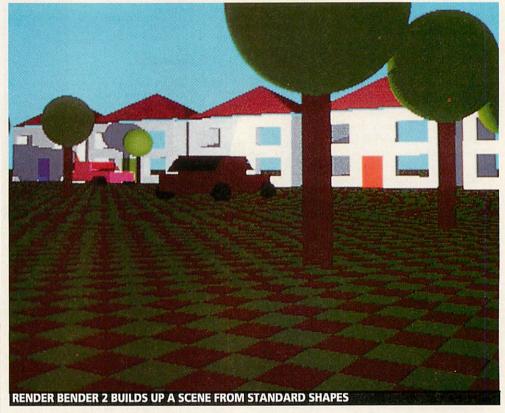
or the uninitiated, ray tracing can be a confusing and complicated subject. It involves using a computer to calculate the paths of light sources in a stored scene. Scenes are made up by joining together a number of objects, such as spheres, tubes and cubes, to form more complex objects - rather like building things from Lego.

Depending on the complexity of the ray tracing program, objects can be made to resemble different surfaces such as glass, mirrors or matt, and the results obtained with a powerful computer can be quite breathtaking. The recent Terminator II film is a fine example of state-of-the-art computer graphics and shows just what can be achieved by ray tracing.

The first commercial ray tracing package for the Archimedes was Clares' Render Bender. The program capitalised on the fact that the Archimedes is ideal for ray tracing with high-resolution colour graphics for displaying realistic images and a fast processor that can calculate pictures in a relatively short time, at least when compared to other home computers.

(For those who want to delve deeper, the original review of Ray Bender can be found in the July issue of BBC Acorn User and a technical explanation of ray tracing is found in the May 1989 issue)

But although the original Render Bender gave excellent results, it fell down severely when it came to user-friendliness. In order to create a scene, a 'program' had to be written to describe each object and its position. To produce a recognisable perspective, a lot



of time was spent juggling numbers on a calculator to make sure that everything was correctly positioned.

Added to that, one was never quite sure how things would look, once the ray tracing had taken place, even after an hour or so of nail biting. The old saying, 'a picture is worth a thousand words' had never been so true.

#### RENDER BENDER 2

Render Bender 2 was born as a direct result of the above limitations. What was needed was the ability to actually draw scenes as shapes in an editor, and view them as a perspective projection, in a similar way to the final scene. Render Bender 2 does exactly that.

Like the original version of Render Bender, there are three distinct parts to Render Bender 2. The script language editor has been replaced with a Wimp, mouse-driven 3D editor. The new front end, called Illuminator, allows you to position any number of prebuilt objects in a three dimensional environment.

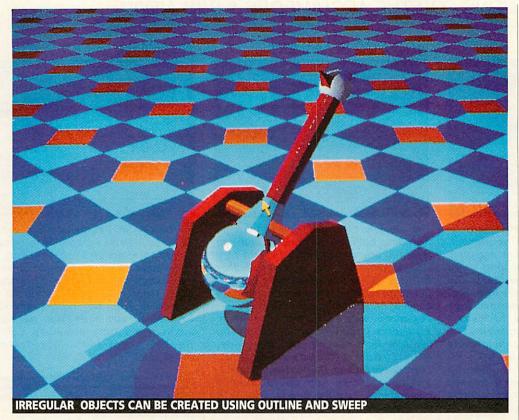
The size of an object is governed by a bounding box, which can be dragged to the correct size using the mouse. Once positioned, an object can be rotated, moved or scaled on any of the three axis. Different windows are used to show front, back and side elevations plus plan views from above and below the scene.

Two types of view are avail-

able - solid or wire-frame. The advantage of wire-frame representation is that it takes less time to display. Wire-frame pictures can, however, make a scene look very confusing, especially when there are a number of objects in front of each other. In this case, solid representation helps to provide a more coherent display.

As well as the primitives found in the original Render program, (spheres, Bender cuboids, pyramids, ellipses, cones and cylinders), Render Bender 2 gives you two new ways to create objects - Outline and Sweep.

Outline provides a neat method of generating irregular objects. Once the position and size have been fixed, a small



grid appears that allows you to design your shape by dragging 'rubber-band' lines around it.

The resulting object can best be compared to one obtained by cutting a shape out of a piece of board. A width parameter gives control over the thickness of the created object. In the original Render Bender, creating anything bar the simplest 'alternative' object was nigh on impossible, so this new tool is an excellent addition to the program.

Perhaps even more useful than the Outline tool, is Sweep. This allows objects to be created by defining one side in half-profile, which is then rotated around a vertical axis, to create a solid object.

Any objects that has a symmetrical side profile can be designed in this way. Goblets are an ideal subject, as are vases and bottles, so you are sure to see lots of 'still life' pictures, demonstrating Render Bender 2 in the future.

Another new feature that cuts out a lot of hard work is Text. Like any object in Render Bender 2, text has to be constructed from the primitives available. Imagine trying to put together all the shapes required for one letter, let alone a whole sentence. With the Text tool, a boundary box is used to mark the size and position of the text, and then you can type in the text itself. Render Bender 2 then looks up all the shapes required for each letter from a pre-designed group and forms the sentence.

Three fonts (or letter styles) are allowed. Letters can be made up of rectangular tubes, touching spheres, or interlocking spheres. One omission is that there is no provision for using standard outline fonts but since these require the ability to interpret bezier curves, outline fonts could have made the process unecessarily slow.

#### LIGHTS AND VIEWS

In addition to objects, up to four light sources can be placed within a scene. Pointlights act like ordinary light bulbs and radiate light in all directions, whereas beamlights allow light to be pointed in any direction.

Two markers, the light source itself and the target to which the light will shine, can be placed anywhere in the scene. Light can cross objects diagonally, appear from objects (good for headlights on cars) and it is even possible to place light sources inside objects made from coloured glass - giving coloured light.

Spotlights are very similar to Beamlights except one can control the width of the beam with an adjustable aperture.

One object that is always present in any scene is the viewpoint. Like Beamlights and Spotlights, the viewpoint has two components; the position of the eyes, and a target marking the direction of the view. By moving the two components individually, scenes can be viewed from any direction you wish.

Once a scene has been builtup using Illuminator, a special View window gives a perspective view of the scene, allowing you to see how it should look in the finished picture. At this stage it is possible to edit any of the placed objects.

If, for example, you wished to rotate a box, moving it to its new position is a case of selecting which axis you wish to rotate around and then dragging the selected object with the mouse. Although this method is quick, there is a disadvantage. Using the mouse can be rather inaccurate.

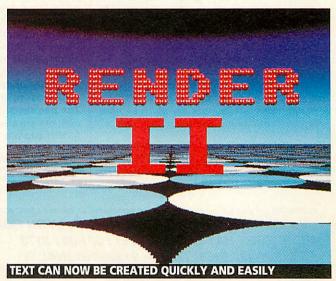
An alternative method is to select the object to be rotated and type in the axis and exact angle you wish to rotate by. Scaling and moving of objects can be achieved by typing in the relevant information in a similar way.

Like Draw, Illuminator allows a number of single objects to be grouped into one 'macro' object. These macros are then treated as single objects and can be scaled, rotated or copied.

#### ANIMATION

As with the original Render Bender, the new version of the program allows a number of scenes to be built up into an animated scene. Producing a moving object in a scene is simply a case of giving Illuminator the start and end positions of the object and the number of frames you require. It will then use this information to generate all of the inbetween frames.

As well as moving objects in straight lines, curved paths can be defined by entering formulas that control the X,Y and Z positions and angles of rotation. For instance, if you



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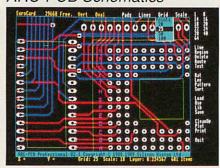


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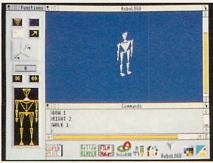


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#### RiscBASIC

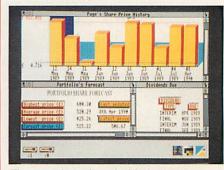


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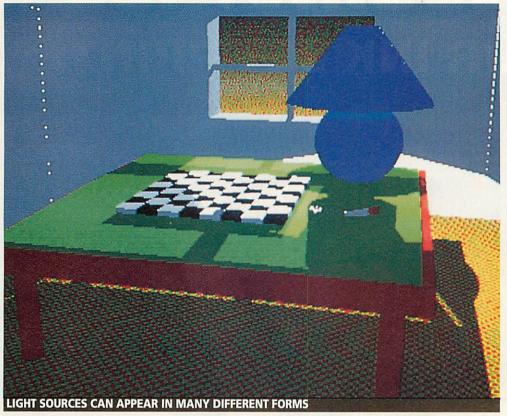
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wished vto make an object bounce in a scene, entering Yposition:SINRAD(FRAME \*36)\*150 would cause the object to follow the Y position of a sine wave. It is also possible to move any defined lights and viewpoints. By moving the position of the viewpoint, all sorts of clever effects can be achieved, such as panning and zooming.

Before attempting to create an animation sequence, a special preview window can be called up that shows all of the frames super-imposed on one another.

#### RAY TRACING

When you've finished a scene and are happy with the position of all the objects, the actual business of ray tracing can start. You can load up the Render Bender application alongside Illuminator.

Both programs should run together on the desktop in a 1Mb machine, (although you can run into memory problems if you want to use high-resolution modes). You can then drag a scene file across from one application to the other or save a file to disc for ray tracing later.

Two types of file can be saved out from Illuminator. Illuminator files contain all

information about a scene, including details of any animation or grouped objects. Scene files contain all the necessary information for ray-tracing, and this means that they can be transferred over to the Render Bender application directly.

Users of the original Render Bender will be glad to know they can load their original scene files directly into Illuminator and convert them into the new type of file.

The ray tracing part of Render Bender 2 is almost identical in use to that of the original Render Bender, except for the fact that it now runs under Risc OS on the desktop. Once loaded, clicking on the Render Bender application brings up a list of parameters that effect the output of the ray tracing, in an identical arrangement to that of the original program.

People who have used the original Render Bender will be immediately at home with Lamp Averages and Opaque Refractive Indices. All parameters can be changed by typing them in at the keyboard or by selecting them from a menu using the mouse.

Because Render Bender now runs from the desktop, it is effectively mode-independent and will now allow scenes to be ray traced into any 256 colour mode. The multi-sync mode 21 gives excellent results (for instance, colour dithering actually works properly). However, it takes double the time for a mode 15 screen because this uses double the resolution.

No direct support is given for the Serial Port's PCATS colour card, although the manual does state that any 256 colour Risc OS mode can be used for ray tracing.

The other advantage of having the Render Bender application running from the desktop is that ray tracing can take place in the 'background' while other Risc OS programs are being used. It does however take a lot longer to produce pictures this way. Render Bender can be made to run in isolation giving much faster results.

#### ANIMATOR

The final program in the Render Bender 2 suite is Animator. This is effectively a desktop version of the Delta Animator, part of the original package. Animator works in exactly the same way as its predecessor, requiring a list of the frames to be animated.

In simple terms, Animator works by comparing each successive frame in an animation

sequence, extracting any data that changes from one frame to the next. By storing a copy of the first frame, plus all of the subsequent changes, the size of animation sequences can be drastically reduced.

As well as Render Bender pictures, Animator can process a number of files from other packages, including ProArtisan screens, sprites and files from Clares' forthcoming Illusionist program.

#### CONCLUSION

Render Bender 2 is a definite improvement on the older version. It still produces impressive graphics (and can understand scenes created with the original Render Bender). In addition there are a number of changes that make it far easier to use than the original.

Designing scenes is much easier using the 3D editor and the addition of the preview mode removes the uncertainty that was so often experienced when using the old program. Two new tools, Outline and Sweep, allow you to create unusual shapes in a straightforward way. Writing text into the program is also a far simpler process than before.

Other ray tracing programs do exist for the Archimedes, but none, to date, are as easy to use as Render Bender 2. Although it is limited in the selection of primitives, and lacking in special effects such as texture mapping, it offers plenty for the enthusiast.

Anyone familiar with Risc OS programs (especially Draw) should be able to get up and running immediately and create films within a couple of hours.

At £135 Render Bender 2 is on a par with similar packages and remains the best ray tracing option around.

#### PRODUCT DETAILS

- Product: Render Bender
- Suppliers: Clares Micros, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7DA. Tel: (0606) 48511
- Price: £116.33 (An upgrade from Render Bender to Render Bender 2 costs £79.95)
- Description: A user-freindly ray tracing program to create graphics and animation
- Machines: Archimedes and

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#### **Expansion Card Case**

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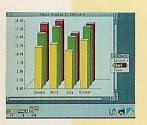






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At last - a fully integrated suite of database, word - processor, spreadsheet, charts and communications for the Archimedes. The database is simple to set up with a flexible card layout enabling you to design cards to suit your data. Video style controls make it easy to browse through the records. With instant search on fields, sort routines and reports available, DTOBase gives flexibility whilst remaining simple to use.

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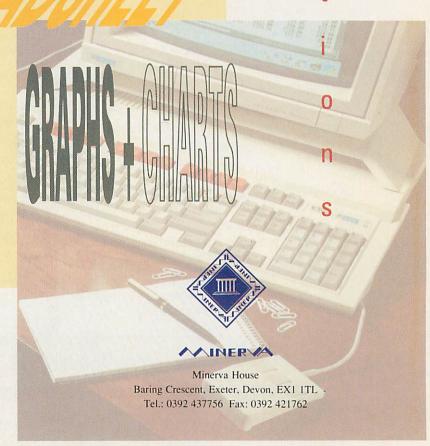
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DeskTop Office is a fully integrated, multitasking suite of programs for the Archimedes and A3000. Data can be transferred between the programs giving the ultimate in flexibility to produce graphs from your spreadsheet data or similar

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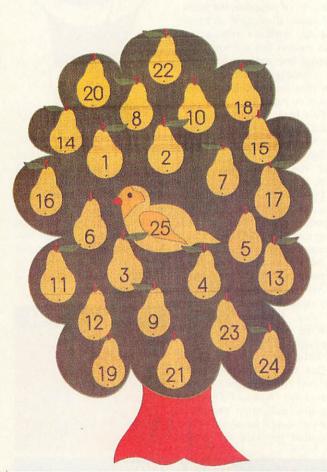


#### **DAVE FUTCHER**

takes a look at a festive supplement to ESM's Desktop

Folio package

# CHRISTIMAS ACKER





THIS ADVENT CALENDAR COMES AS PART OF THE PACKAGE

very Christmas thousands of greeting cards and New Year calendars appear in the shops, and they seem to get more expensive with each passing year. The good news is that, if you have an Archimedes or an A3000, you don't have to buy these mass-produced cards - instead you can produce your own using a desktop publishing system.

To help you with your festive publishing, ESM, the publisher of Desktop Folio, has produced a Christmas Pack, full of stationery, clip art and other resources. It could be useful for schools, home users, clubs and churches and is the first in a series of four DTF Theme Packs due out before the BETT show in January 1992.

The pack consists of two special DTF work discs containing stationery and a library full of compressed graphics. There is also a comprehensive handbook included, to help you get the most from the material provided.

The pack can be used for a host of publishing tasks, not just for cards. Teachers can make worksheets, while children can make Christmas custom booklets or write stories complete with illustrations. Churches can have impressive carol sheets for their nativity service and it is even possible to design menus to accompany a Christmas lunch. But one of the biggest

advantages is in being able to produce your own cards and calendars, to personalise your seasonal greetings.

#### GREETINGS

The Desktop Folio Christmas Pack allows you to produce specially designed stationery, including novelty cards and the more traditional styles.

There are a couple of layouts for the normal two-page A6 portrait-style cards. The front page has an empty



| January   |                               |    | 1992 |    |    |
|-----------|-------------------------------|----|------|----|----|
| Surday    | ARCALING TO BE REAL PROPERTY. | 5  | 12   | 19 | 26 |
| Monday    | electric de tracidente (      | 6  | 13   | 20 | 27 |
| "Tuesday  | andokoedaliaanan              | 7  | 14   | 21 | 28 |
| Wednesday | 1                             | 8  | 15   | 22 | 29 |
| Thursday  | 2                             | 9  | 16   | 23 | 30 |
| Friday    | 3                             | 10 | 17   | 24 | 31 |
| Saturday  | 4                             | 11 | 18   | 25 |    |

#### A CONVENTIONAL CALENDAR IS ALSO INCLUDED

graphics frame which is linked to specific directories, full of suitable art work. The inside page has frames set-up for the verse to be added and it is worth using a script style, such as Freehand or Finescript, from 4Mation or EFF. Landscape cards and A5 cards are also catered for.

The Christmas card section of the pack also covers 'origami-style', so you can make cracker, concertina and pop-up cards. As well as providing the basic design and suitable graphics, all of the mechanics are covered.

To put the final touch to your cards, the pack provides the resources for making personalised envelopes and greetings stickers.

#### MAKING CALENDARS

Calendars go hand in hand with the festive season, and the pack provides material for making several types of calendars. Some suggested cover designs are provided and the word 'calendar' and the years '1992 to 1995' are available as artwork in a number of decorative fonts. This is very useful for users without an extensive font collection.

Three basic framework designs are provided for the actual calendar pages children can easily vary these by using different graphics and fonts. Once the basic design has been created for January, the frames containing the days are made permanent. Then the page is copied for the remaining months and, finally, the month and position of the dates are entered.

A school may wish to publish its own personalised calendar, with school holidays and training days marked - a helpful memory-jogger for many parents. With the resources provided by the pack, enterprising schools or PTAs may even wish to sell or give away professional looking school calendars, which can include advertising. Such calendars can be developed with minimum effort and cost to the school itself.

Advent calendars can also be produced with the pack. This involves designing two pages, which can then be glued together. Page one has the main illustration for the calendar and all the windows that the advent calendar uses are spaced around it. Once printed, the windows have to be carefully cut and folded so that they can be opened when the correct day arrives. Page two is a copy of page one, but with the main illustration deleted and the windows remaining. This ensures that the windows on page one and two will line up correctly. Small pictures can then be dropped into the spaces on page two.

Two basic designs are provided. They are both based on an A4 page but one of the designs is cut to the shape of a pear tree, which comes complete with partridge.

The graphics areas that make up the windows on the second page have been designated linked frames. This means that you can select any of the pictures in the Xmaspics directory, provided on the disc. If you don't enjoy drawing, this catalogue of pictures can be used. However, you can also use your own graphics in the calendar. This is true of all the basic designs.

One thing is certain, the Desktop Folio Christmas Pack proves that Desktop Folio is a powerful publishing package, that can also be fun to use. The resources provided are tried and tested and both children and adults can use them easily and effectively.



Whether it is that special letter to Father Christmas with a decorative border of holly, or the programme for the school nativity play, the DTF Christmas Pack will help you design and make it with ease. It is suitable for all types of users, and it could make designing for Christmas a whole new Advent-ure.

#### PRODUCT DETAILS

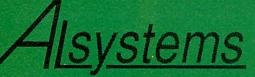
- Product: The Desktop Folio Christmas Pack
- Supplier: ESM, Duke Street Wisbech, Cambridgeshire PE13 2AE
- Price: £35.00
- Machines: Archimedes,

#### OTHER OPTIONS

Desktop publishing (DTP) is easy on the A3000 and the Archimedes and there are many additional tools available to assist in your Christmas publishing tasks. As well as a growing range of serif and sans serif fonts there are now a number of decorative fonts, which include some festive styles. These include: Snowball supplied with Poster from 4Mation Educational Resources; Drift, which is supplied with twelve other fonts in the Archimedes Pendown Font Pack and Xmas from the Electric Font Foundry.

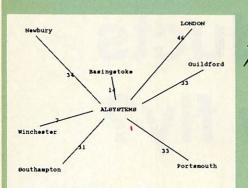
There is also quite a lot of public domain (PD) Christmas clip art available, including candles, holly, bells, reindeer, snowmen, Santas and Christmas trees. A more extensive collection is available from Primary Education Services, which produces two discs of Christmas Draw files, NorthWest SEMERC also has Draw and Paint files, produced initially for use with its Phases #2 wordprocessor and Genesis and Magpie.

Telephone ALTON (0420) 561111

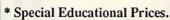




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Optimizing and autorouting tools — for ideal component placement and multi-layer design - are also included in the package.

Because of its low price but powerful performance, CadMust is suitable for production companies whatever the size and educational requirements.

CadMust programs run on all Archimedes systems (with RISC OS and a minimum of 1MB), the A3000 and Acorn Unix systems.



PUBLISHED BY

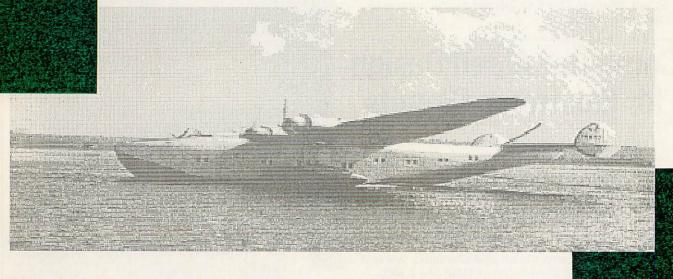
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# Want products that really fly?



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The new Acorn PC Emulator software can share the desktop with native Archimedes applications. SIMON WILLIAMS

trys it out



corn's decision to emulate the IBM PC on the Arc originally worried users. It soon became apparent, though, that the emulator provided an stable and compatible PC clone inexpensively and at tolerable speed.

Even so, the emulator had a number of shortcomings - it took over the whole Arc and needed a reset to switch from the emulation back to the 'native' mode. The emulator's CGA graphics also restricted the use of many PC applications. These are the limitations that the new Emulator aimed to overcome.

An Arm2-based machine with 1Mb of Ram and a medium-resolution monitor is the minimum configuration that you can run a PC emulator on. The old emulator is supplied in Acorn's package as PCEmS so, if you have a 1Mb configuration, there is little point in upgrading to the new version as there will be no memory left over for.

PC Emulater (EGA ECD 128K) adfs::HardDisc4.\$ 1 Col 42 Insert Zaiting:- CAPUBLIS Fonts Boot (Arcel "xosx"=="CDOS" suspend=on 1004 if "xosx"=="CDOS386" suspend-on if "xosx"=="CPCDOS" suspend-on Ť. !Protext !System TOU DROOT !SparkPlug Save screen Save text od \genapps\gensys if exist . \fonts\\*.inf del . \fonts\\*.inf rem DO NOT REMOUE THE NEXT LINE! Connect mouse PCText III genudi C:\publish\publish.app \*\*\* END OF FILE \*\*\* :4 :1 :8 图 理 / PC PROGRAMS CAN NOW BE RUN FROM THE RISC OS ENVIRONMENT

However, if you add a megabyte, giving a 2Mb machine, the new emulator provides the distinct advantage of multitasking with Risc OS. You can run the emulator in a separate window and facilities are incorporated to copy the PC screen as a sprite file, or to strip all the text from it into a normal Edit file.

With a medium-resolution Acorn or Philips monitor, you cannot display a full EGA screen and have to scroll up and down the window to see all parts of the screen which ca be annoying.

Once you upgrade to a full 4Mb of memory, replace the Arm2 with an Arm3 and add a multiscan monitor, you have a set-up that is a good deal more useable. With a multiscan and the VIDC enhancer, you can use a more expansive mode, like 101, to view most of the PC screen alongside an Archimedes window. The Arm3 gives the emulator a fair turn of speed, though the test results show that the applications still run only slightly faster than on a 4.77MHz XT.

The emulator can take up nearly half of the 4Mb of memory on a fully-configured Archimedes. When we used it alongside a copy of Impression with a single frame open, there memory difficulties when importing a full screen

sprite. But, despite these problems, the new emulator is a step forward. Now you can work with PC programs alongside native Archimedes ones, transfer data and screen dumps easily between them and run a good variety of PC applications at a reasonable screen resolution. You do, however, need a multiscan or VGA monitor to view a true EGA screen, and more than 2Mb to run anything useful alongside a PC application.

Even then, you can not easily use Archimedes memory as PC memory above 640K. For a workable turn of speed, an Arm 3 upgrade is also needed. If you have such a system, the new emulator gives good PC compatibility in or out of a Risc OS window.

#### **PERFORMANCE**

We tried running a suite of application tests on three different Archimedes configurations and on two true PCs. These three application tests - which simulate the kind of work that your machine might do when running a spreadsheet, a database or a wordprocessor respectively - show that the Arm 3 boosts the PC Emulator by roughly 100 per cent.

|            | PCEmS<br>ARM 2 | PCEm<br>ARM 2 | PCEm<br>ARM 3 | 8086XT<br>4.77MHz | 80386AT<br>25MHz |
|------------|----------------|---------------|---------------|-------------------|------------------|
| Calculate  | 29:03          | 30:00         | 15:14         | 12:45             | 1:15             |
| File       | 6:18           | 6:27          | 3:48          | 9:07              | 1:52             |
| Manipulate | 18:07          | 17:07         | 8:20          | 9:19              | 0:54             |

#### PRODUCT DETAILS

- Product: Acorn PC Emulator
- Suppliers: Acorn dealers
- Price: £116.33
- Machine: Archimedes, A3000

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**ArcTools** 

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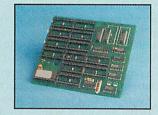
| BBC/Master       | £104  |
|------------------|-------|
| Compact          | £120  |
| RML Nimbus       | £104  |
| Archimedes       | £125  |
| Optional PSU     | £9.50 |
| Upgrade from BBC |       |
| to Archimedes    | 635   |

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#### SPARKLE

AnDi ODDULE

Sparkle is a fully RISC OS compliant control package for the A3000 & Archimedes allowing full control of input, output and motor devices via most control boxes. Sparkle is a simple language which gives users full access to control boxes as well as the ability to use analogue equipment and simulate inputs & outputs in a variety of wavs.

Data & frequency logging and counting & timing facilities are also provided as standard.

Sparkle Site Licence

AnDi ODDULE Optional Adaptor

#### The AnDi Oddule is a low cost control box for the A3000 & Archimedes. There are 8 input/ output connections, 4 analogue to digital inputs and 1 digital to analogue output. The box connects directly to an I2C connector (as on our Analogue & UserPortinterface) or can connect to a standard podule socket via an optional adaptor. The box can be controlled directly via RISC OS SWI calls or using Morley's Sparkle control software.

#### £49 68

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The complexity of exercises that can be carried out will benefit school children who are being introduced to robot technology or technical college students requiring an in-depth understanding of industrial robots.

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# SHOW TIME

With the BAU show on this month's agenda, SAM GREENHILL looks at some of the delights in store for games fans

t's show time at Wembley! The curtains go up for the BBC Acorn User show and what do we find under the spotlights? Well, since our show preview last month, very little has been announced in the games world, except from the trusty boys at The Fourth Dimension of course. They will be launching an arcade adventure game called Pandora's Box which, thanks to the 3D isometric view, is a bit like a cross between Spellbinder on the BBC micro and some of the old Ultimate games. You control a wizard, and the idea is to travel from room to room collecting, shooting and exploring.

One Man and His Dog will never be the same again when Chopper Force, a helicopter simulator from The Fourth Dimension, is released next March. The game is only just beginning to take shape now and, although all the hovering aspects have been taken care of, there is only one thing to actually do when you fly around - and that's shoot sheep! You hover near them and then open fire with your

futuristic photon laser and they fly up in to the air, spinning around before landing in the ground with their legs stuck in the air. Truly sadistic! By next March a proper mission or two should be incorporated in the game but, for the time being, it is your destiny to stop those grass-eaters.

Although Superior Software doesn't have a stand at the show it is now possible to buy its latest Archimedes/A3000 game Air Supremacy. In Supremacy you can fly planes, drive tanks or ride boats around the landscape, doing all of the usual destructive chores, in an attempt to complete the level and better your vehicles.

This month we've got quite a few hints and tips to give away. Martin Latter from Littlehampton in West Sussex has noticed that Saloon Cars from The Fourth Dimension is a very difficult game to play. Very good, but very tricky. Unlike the rest of us though, Martin decided to something about it and, better still, has sent his solution in for the benefit of the rest of us. It's the sort of remedy that



tends to solve most problems in life, so no marks for originality, The solution? Money!

You'll need to have a savedplayer file to work with, so either backup an existing file or load up the game and create a new one. Once this is done enter Basic by pressing F12 in the Desktop and typing \*BASIC, then type \*LOAD "filename" 9000, where filename is the name (including the path name) of your saved file. Next enter ?&905E=&50 followed 2&907A=&09 to alter the file and finally \*SAVE "filename" 9000+9BF to save it back to disc.

The file is now ready to use in the game. The latter alteration is the computer's equivalent of bribery: you've just won the first nine races!

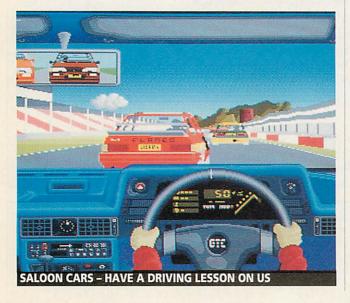
Two people have sent in the same tip for playing MiG-29 Fulcrum, the Soviet flight sim from Domark. Martyn Rose of Middlesborough, Cleveland and the infamous Ganesh 'The Bear' Yoganathan of St. Albans, Herts. provide a way of obtaining a high enough score to play the final mission without needing to fly the other ones first.

Play the Blue mission and fly over the sub as low as you dare then fly back to base and land safely. When you press CTRL-D the game will present you with 100 points, congratulate you and so on, and then suggest that you go on to the next mission.

Instead, select the Blue mission again, but don't bother to take off. Just press CTRL-D to get back to mission briefing and bingo! Another 100 points are awarded just like that!

Martyn Rose also sent in some passwords, which will please those of you completely stuck on either the excellent Ballarena from Eterna or Bug Hunter in Space from Minerva. They are: punkandjump, montpellier, sea sex sun, mountaineers, vl 86 c 101, grenouille, blubedilomar, brain killer, rhythm box, boubouloid, menfou, 32 bit power, martini, see you soon and for Ballarena. humanoid, adamski, suggs and posdnuos for Bug Hunter in Space.

No doubt Martyn will be the cause of much dust flying off old copies of these games!



### Why don't you clean up your act?



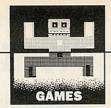
### With the HCCS HardCard!



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HardCard45 £349.00 ex VAT carriage FREE
HardCard100 £699.00 ex VAT carriage FREE.e&oe



# GAIVIE SHOW

#### MiG-29M Super Fulcrum

Domark, Tel: 081-780 2222 Archimedes/A3000 £44.99

MiG-29 Fulcrum is the predecessor to this game and is one of the best games for the Archimedes and A3000, certainly the best jet simulator. In it you pilot a Soviet MiG-29 fighter jet around several missions and use guided missiles, rockets and a super-smooth plane to thwart the enemy. Perhaps the best thing about it is the unbelievable smoothness of the aircraft as you fly.

Super Fulcrum has lost none of these features, and has gained a few more. For example, the cockpit has changed to look very high-tech and a few new snazzy readout displays have been implemented. This is all taken from the new MiG-29M soon to be displayed at the Paris air show by the Russians, and it is interesting to note that even the Americans have admitted they would have been completely defeated by

the jet if they had ever been forced to do battle against it!

Another major addition is the facility for two people to their machines connect together - and it is possible to link an Acorn machine with an Amiga, PC or ST to fight against one another. Although this starts off as fun, there is really only your opponent and four pyramids to keep you company, so this feature has a limited life.

The game has a few nice gimmicks, such as mid-air refuelling, but is essentially a new mission for an old game. The mission is to progress around a South American country taking rebel airfields one by one and slowly reducing the enemy's defences. This is great fun but also very repetitive and there is little in the way of extra graphics, seen in other flight sims.

Despite the odd improvement, we have taken a step backwards. Super Fulcrum contains only one, albeit very large, mission and thus lacks



the welcome diversity offered by Fulcrum. Also, this scenario is highly reminiscent of Interdictor 2 from Clares, which was written by the same programming team. The difference is that Interdictor 2 is both better and cheaper.

It seems likely that Domark intended this game primarily for other formats, but decided

to release it for the Archimedes and A3000 as well.

While it is always good to see the Acorn market supported, the MiG-29M Super Fulcrum will set you back £45. This is surely an unreasonable sum to charge, when we can buy Interdictor 2 for £10 less.

Sam Greenhill

#### BLASTON

Eterna Software. Tel: (0933) 279300 Archimedes/A3000 £19.95

This innovative French software house now has 11 titles for the Archimedes either released or under development, and nearly all of them are of very high quality. More often than not, an original idea is given great graphics by resident artists as well as skilfully sampled sound but what is sometimes lacking, as here, is the gameplay. Here, buried beneath the ludicrous sci-fi background story is a better than average vertically scrolling shoot-em-up.

Your mission over four astonishingly drawn levels is to win back control of the Galaxy's uranium supply from the evil Korguls. Your character, who is viewed from above, can obtain several upgrades and weapons systems by shooting at spherical tokens to help him blast the Korguls into tiny bits. With these tokens you can buy shields, more speed,

smart bombs and the like, but the twist is that the aliens are already armed to the tentacles, and you'll be lucky to survive more than five minutes unless you learn fast.

The battleground moves from a desert to a factory, then a space-grill and finally the



Korguls' home turf. They menacingly zoom around you, leaving you dizzy and frustrated, since they run away as you try to retaliate. Honestly, anyone would think they didn't want to be blown up!

Unless your oxygen supply is replenished regularly, your

head swells and explodes à la Total Recall. If your heart rate drops to below 10 then you know you're in trouble as well. There's plenty to stop you but if you invest in speed and weapon upgrades, you can get at least some chances to retaliate in kind.

All in all, the game is good fun, but it's not varied enough, with you simply ploughing ever-upwards to the strains of plinky music, similar to that in the game Tactic.

Beautifully crafted though this is, there's not enough interaction with your sur-roundings. This is nonetheless a good buy for those who feel at home in a deluge of enemy laser fire

**Mathew Tizard** 

#### **TOP BANANA**

Hex. Tel: 071-701 0652 Archimedes/A3000 £25.99 (includes T-shirt)

It's not easy knowing where to begin with Top Banana. From the pop video intro and the dance-megamix soundtrack to the game itself, everything is weird with a capital W. Top Banana is basically a platform game. The scenario runs like this: 'you must use your power of Love to save the planet from impending ecological disaster and release hidden hoards of succulent riches.

This basically translates to jumping up through different levels on a series of platforms, dodging what look like waiters, bulldozers and chainsaws. I can see the link between the bulldozers and chainsaws, but where do the waiters fit in? Must be all that paper they use taking orders...

The aggressors can be removed by throwing hearts at them. When hit, the aggressors turn into either coloured hearts, which give you special powers, or fruit or sweeties. More fruit and sweeties can be



found dotted around the platforms and can be collected for bonus points

As the game progresses, further meanies appear in the form of blobs of acid rain that drip from branches, and giant pink rabbits that fall from the sky. Both have to be avoided at all costs.

Unlike most games of this type, there is no real time limit. There is however, the small problem of the polar ice caps melting, which slowly floods the current world. Should the water reach your feet, you're in for an early bath and one step closer to death. The water can be turned off by activating a tap situated near the top of the platforms.

When you've finished three levels, it's on to the next world. Each world has a kind of theme; the first is the rain forest, the second, a 'technoir' background. Things get distinctly more bizarre the further you progress, with the final world culminating in The Mid Scape - a psychedelic orgy of day-glo patterns, coke cans and grinning faces.

Top Banana has to be one of the most playable games

Γ ve experienced on the Archimedes. Control of your character is excellent and you can even move left or right in mid jump to avoid the nasties. When the game is paused, the graphics can look quite muddled. When you're moving though, all the background and platforms move up and down in glorious parallax, giving a real sense of depth.

Motion and animation is exceptionally smooth, with full use being made of the Archimedes' 256-colour mode 13 graphics. All the graphics have in fact been grabbed with a video digitiser, making the game a graphical equivalent to a sampled house track. Sound throughout the game itself is on a par with the graphics; weird and excellent. Collecting fruit or sweeties produces a kind of 'yum' sound which comes out sounding more like a distressed sheep.

At £25.99, Top Banana could be seen as a bit expensive, but with the added bonus of a free T-shirt, you should get your money's worth. Buy it now and save the world!

**Timothy Leary** 

#### TOWER OF BABEL

Cygnus Soft. Tel: (0533) 559711 Archimedes/A3000 £24.95

It would be really nice to be able to say that Tower of Babel was a totally original game. New ideas are few and far between these days and although 'Babel has a number of innovative features, it is still basically a puzzle game rooted

firmly in the Repton camp. The game consists of a number of groups in each of which are nine three-dimensional ('Babel-speak for 'towers' screens). Each tower has an objective - either shoot a certain number of robots, collect a given quantity of klondikes small pink ingots - or maybe a bit of both. Once this is achieved, you are allowed to progress to an adjacent tower. Completing seven towers gives you access to the next group.

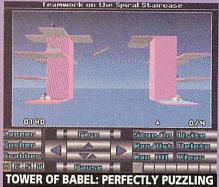
On any given level you are put in control of up to three giant mechanical spiders, unaffectionately known as zapper, pusher and grabber. The tower can be viewed (in solid 3D) from the point of view of any currently active spiders. Most towers also have 'external' cameras that can be moved

along the edges of the tower inspecting it.

Selecting a spider will allow you to control it by clicking on move, turn and fire buttons at the bottom of the screen. The outcome of 'fire' depends on which spider you're driving and what you're firing at. Fairly

obviously, the zapper shoots things and the pusher repels things. The grabber has a number of special functions in addition to collecting the allimportant klondikes - it can control lifts and freeze movement to name but two. It is also possible to program the spiders with up to eight commands and these can be executed at any point in the game.

All movement within the game is performed in discrete units move forward means move one square. A tower can consist of up to four physical levels (connected by lifts) of 8×8 squares.



All 3D views are orthogonal you can only look north, south, east and west

Sounds easy doesn't it? Well, it is, up to a point. Then the alien defences appear. There are fixed and rotating zappers and pushers that can shoot and move your spiders. Blocks, worms and watchers get in the way. Flags and hoppers can be shot. Bombs and

mines explode. Reflectors and prisms cause havoc with your spider's firing. Not to mention lifts, freezers, wipers, exchangers and converters. Just about all of these are beautifully animated and the spiders' lolloping gait is perfect. Add to this the background graphics (sky, stars, moons, shooting stars) and the atmospheric sound effects and you have a wellpresented game.

A lot of care and attention has gone into the front-end. All the menus and options are exceedingly easy to use. Other companies, please take note! Sideways movement keys and an Identify Alien facility would have been nice but the most important thing is that this game is fun to play.

Maybe TOB is not the one to go for on a continuous basis. but certainly playing a tower or three, when you get tired of your work routine, is very relaxing. And, if you do get bored with the game, you can always start tinkering with the tower designer...

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#### **LEMMINGS**

Krisalis Software Tel: (0709) 372290 Archimedes/A3000 £25.99

things. lemmings. You've got to hand it to them, they'll try anything: hang-gliding, swimming, fire-eating, standing under large weights, you name it. Trouble is, in each case they forget something rather vital, such as the hang glider or the waterwings, and your job is to save them. But you know this already, and if you don't know the object of Lemmings then read the rest of this issue of BBC Lemming User, sorry, BBC Acorn User.

Point is: this issue is stuffed with lemmings. It's all good press and rightly so because Lemmings is a very fine game. But reviews are objective, so here come the negative views.

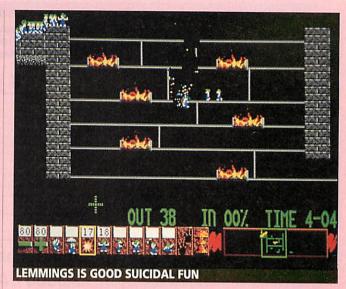
You could argue that the Acorn version deserves better graphics and sound than the other incarnations and it might

have been possible to use the Acorn's enhanced speed to improve the resolution and smoothness of the game. But as it stands, it is almost identical to the Amiga version.

Being the pedant that I am, I shall point out that I found it a bit irritating when I pressed the space bar to continue, and nothing happened. It is normal Acorn practice to whack the space bar, so it would have been nice if Krisalis could have implemented a 'fail safe' routine to keep idiots like me, who can't read, happy.

The other point is that to get back to the main menu screen you can end up being forced to click Select, then double-click Select or press ESC, and then finally click Adjust on the mouse again before getting there, each time waiting for the screen to fade out and fade in.

However, I'm being very fussy. It was seriously difficult to think of anything negative to write about Lemmings. It's the sort of game that you either



love or hate. If you enjoy it then just about everything is perfect: the graphics, the music and, of course, the animated lemmings.

The sound effects are dead funny: when you ask a lemming to self-combust it shrieks 'Oh No!' in a high pitched voice, then holds its paws over its ears quivering with fright before blowing up! This game is possibly one of the most sadistic ever.

Buy it - it is by far the best game on the Archimedes/ A3000 to date. And don't forget to play the BAU Lemmings demo on our free disc.

Sam Greenhill

#### **BREAK 147 &** SUPERPOOL

The Fourth Dimension. Tel: (0742) 700661 Archimedes/A3000 £24.95

When we first saw screenshots of this game being advertised by The Fourth Dimension last year, we were not impressed. The graphics looked very artificial indeed, with the table set in a bright white room and each ball sporting a black outline. To The Fourth Dimension's credit the game was not released but postponed while Gordon Key (author of E-Type, Holed Out and Apocalypse) revamped the game almost entirely from scratch.

The results are astonishing. Break 147 & Superpool has all the hallmarks of a high quality glossy game with good attention to detail and what might be described as a nice overall 'finish'. Although it is essentially one game, you can choose to play either pool or snooker and either compete against the computer or another earthling, depending on how you feel and whether you've got any friends.

Both games are very real-

istic. More so than previous pool 'simulators' because this is the first time to my knowledge that you actually control the cue - not a power meter or anything else. The cue on the screen mimics the movement of the mouse, so to perform a lightning break you have to shove the mouse forward a bit sharpish. Not too

fast though, because if you lose control the shot is called a foul - just as on BBC2.

At first the mouse controls your 'legs', allowing you to move around the table. When you've decided what you want to pot and where you want to pot it you click once with Select and the mouse becomes the cue.

At this stage you may make minor lateral adjustments to the cue tip and even shift it vertically to introduce backspin or top-spin. Once the cue has made contact with the ball the mouse takes on another role, that of your neck. Thus you can turn your view from

side to side as you watch the balls careering around the table. In my case, they usually go in all directions except towards the pockets.

One small criticism here: the mouse takes on many a role in this game and, although the direction you move it in is appropriate to the role it's playing at the time, there is a

**GET BEHIND THAT CUE BALL** 

problem. As you swiftly move from walking to shooting to observing you have to keep changing the direction you move the mouse which can become quite annoying. Also, the mouse speed is set by the game, so users who enjoy a high mouse speed on the Desktop will be irritated by the sluggish behaviour of your

'feet', for example.

Penultimately, on the negative side, it would be nice to be able to view the table from one of the camera positions immediately following a shot. As it stands, you have to try and control your 'head' to see if the shot contained any measure of success and, by the time you've worked out your elbow from your somethingelse, it's too late.

The only other niggle is that, according to a pool expert friend, the balls are a bit too smalll can't tell. In its favour, the game has a host of other features such as camera view points and replays of the last shot. The sound is something worth noting: the balls click and thud off each other and the cushions very convincingly, and sampled voices have been used to represent the referee.

There are probably no better snooker or pool simulators available. This game is structured well, plays well and in general flows easily and enjoyably. It is visually wonderful.

I just wonder how much in pub expenses Mr Key claimed from The Fourth Dimension, while he developed this one!

Sam Greenhill

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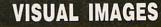
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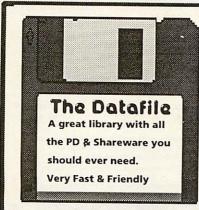
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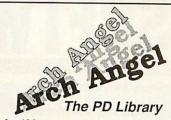
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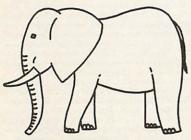
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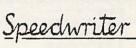
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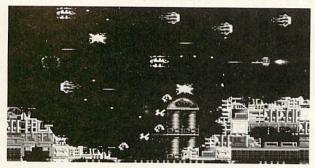
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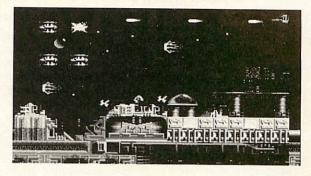
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Twenty words have been hidden in the hexagonal grid below. Words may start anywhere in the grid and can be spelled out by 'tracking' from hex to hex. A word may change direction at any point and any number of times. No letter in the grid is used more than once. Once all of the 20 words have been found, the remaining letters will form an anagram of something to do with computing. Simply write this on the back of a postcard or sealed envelope and send it to 'November Competition' at the usual address. Closing date is Friday 8 November 1991. The solution and winner will be published in the January issue.

Oh, almost forgot! All 20 words have a connection (which should become pretty obvious after a while) and although 'BUGS' may be a bit of a red herring, 'TRACE' is one of the words. Finally, you should be left with - well, let's not give too much away - less than 20 letters at the end.



#### Solutions to October's puzzles

#### **STEPWISE**

Pete the Purple Pirate started digging for his treasure in square A3 after taking 44 paces.

#### HEX-CHAIN-GE

#### Solution to September's prize puzzle

This rather tricky puzzle could be solved 'by hand' but really needed some computer assistance. Miss O'Nardge did benefit from use of the organisation's computer - it found no less than four routes which would take 25 minutes and involve entering 33 rooms. The first correct solution came from Nigel Parker of Newton Abbot, who wins £25.

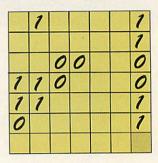
#### Spy Lines

Paul de Sa of Newcastle upon Tyne has sent in this little puzzle and in return we'll send him £10.

M, the head of MI5, needed to send a message to top field agent K. He encoded the message as six six digit binary numbers and wrote them in a column forming a square of 6×6 digits. To complete the encoding, he added a 'parity bit' to the right hand end of each row and the bottom of each column so that there were an even (or zero) number of ones in each line. Unfortunately M had used the branch's latest disappear-

ing ink, so all K got was the message below. Fortunately K knew that M's messages always contained 36 ones and they were symmetrical about the diagonal from top right to bottom left.

You don't need to decipher the message, but can you work out what the coded message should have looked like?

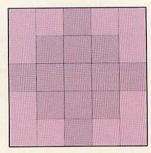


#### **Odd Magic Square**

Our second 'puzzle for fun' this month comes from Mr D Jackson of Redhill, who gets

£10 for his efforts.

Here is a 5×5 magic square with some internal squares shaded. Can you distribute the numbers one through 25 in such a way that all the rows, the columns and the two main diagonals all add up to the same total with only odd numbers appearing in the 13 shaded squares?

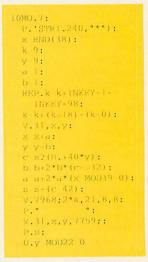


#### Gürth Dragönslayer

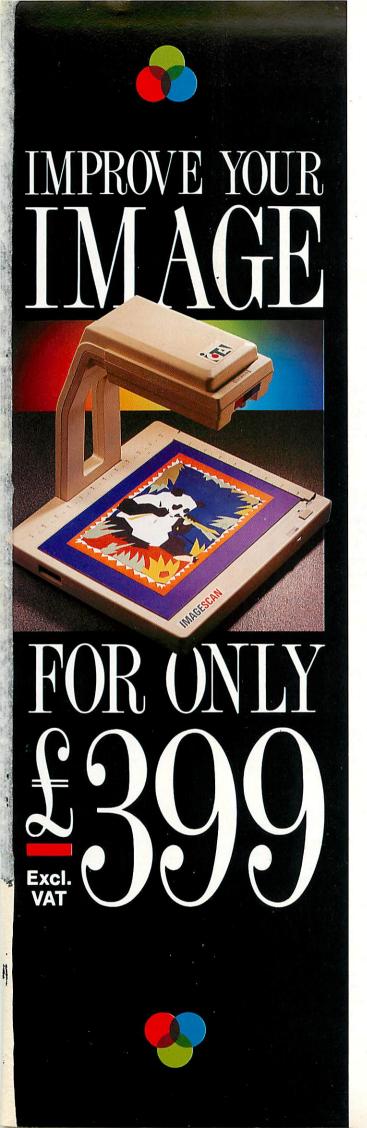
Deep in the heart of Hurnagii swamp all was quiet. Fog curled lazily round the stumps of rotting trees. The mighty

Polupha river began its life here before following its turbulent course to the distant ocean. High above, a Viridian bird erupted from its nest and let out a piercing screech.

The cry brought Gürth back to his senses. He stood on a mound before the ruined temple of Gethmion, his senses ever vigilant for the minions of the evil lord, Zarth. He hefted his mighty battle sword, Aracara, from hand to hand, its keen blade hungry for more of Zarth's hordes. With a speed that belied his size, Gürth leapt down the slope to the temple and started into the darkness...



Unfortunately, Gürth Dragönslayer was busy, so here's a one-line Breakout. SHIFT and Z move your bat.



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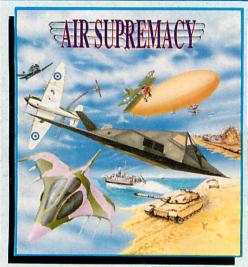
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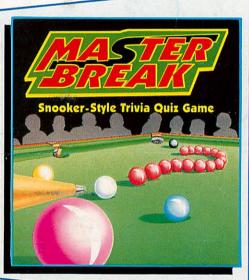
In the 1 player game, try to get the highest break - you might even manage the maximum break of 147. In the 2 to 4 player game, compete against your friends and family for the highest score and highest break.

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